

UNIVERSITY OF KWAZULU-NATAL

**THE STRATEGIC IMPORTANCE OF EDUCATION
TECHNOLOGY IN THE PUBLIC FET COLLEGES IN DURBAN**

By

Shaun David Randles

201300626

Dissertation submitted in partial fulfillment of the requirements for the
Degree of Master of Business Administration

Graduate School of Business and Leadership

College of Law and Management Studies

(UKZN)

Supervisor: Dr. A. Kader

2014

Declaration

I, Shaun David Randles, do hereby declare that this dissertation is the result of my investigation and research and that this has not been submitted in part or full for any degree or to any other University.

Shaun David Randles:_____

Date: 23 February 2015

Acknowledgements

Grateful thanks are extended to all those that contributed to completing my dissertation:

To my supervisor, thank you for all your guidance and reinforcement, particularly when I was under pressure and needed a lift.

To the Tom Farrar, thank you for producing the results for the statistics in time.

Thank you to all those stakeholders and respondents that assisted and participated in the study.

I would like to thank my incredible Wife for her patience, tolerance, sacrifices and support throughout my journey of completing my MBA. Without her, it would have been extremely difficult completing the research dissertation.

Abstract

This study shows how future rapid growth of urbanization that is taking place in countries with large rural surroundings and young populations face serious shortages of relevant human capital. The intention of this study was to examine the strategic importance of education technology in a public Further Education Training (FET) College in Durban. This study focused on and explored the efficacy of mobile technology, specifically mobile messaging technology (MMT) as an innovative tool to teach and learn.

The research adopted mixed methods. The research process firstly utilized a qualitative approach. A list of 5 independent professionals was randomly selected from local business in Durban. The survey method used was interviews. The study yielded a 100% response rate. The researcher followed the inductive thematic analysis approach and used Nvivo 10 to analyse the data. Furthermore, the research process used a quantitative approach. A list of students and teachers was derived from the senior lecturer of the public FET College. The sampling frame consisted of 180 students and 7 teachers. The survey method used was the questionnaire. The study yielded a 100% response rate.

The study revealed that some of the biggest challenges of South Africa's education system would be the rate at which [it] adopts the emerging trend of education technology, and [its] limited technical understanding of people's attitudes towards adopting a digital environment to teach and learn. The analysis revealed that the respondents were amenable towards the utilization of technology as a technique to train and educate people on quality skills, and to share knowledge. However, further examination needs to be undertaken to prove [it] is not an inferior technique to teach and learn.

The research draws mostly upon the importance of the implementation, monitoring and evaluation of the use of education technology to impact the access to quality education.

Table of contents

Description	Page
Title Page	i
Declaration	ii
Acknowledgements	iii
Abstract	iv
List of Figures	xii
List of Acronyms	xvi

Chapter 1: Introduction

1.1	Introduction	1
1.2	Background	1
1.3	Research problem	3
1.4	Aim of the study	4
1.5	Research objectives	4
1.6	Research questions	5
1.7	Scope and limitations of the study	5
1.8	Significance of the study	5
1.9	Format of the study	6
1.10	Summary	7

Chapter 2: Literature Review

2.1	Introduction	8
2.2	Definition	8
2.3	The setting for education technology in South Africa	8
2.3.1	Learner motivation in the formal age	8
2.3.2	Innovation virtual learning environments	9
2.3.3	Invest in innovation technology to transform a learning society	11
2.4	Impact of innovation in education in South Africa	11

2.4.1	Experimentation with technology- based education innovation	13
2.4.2	Significance of constructing a mass education system for the information age	14
2.4.3	Peer-to-peer remedial intervention	17
2.4.4	Integrate open education technology in mass education	18
2.4.5	Lack of qualified and professional teachers	19
2.5	Mass learning using the web	20
2.5.1	Technology in education is shifting learning	20
2.5.2	Exploitation of modern technology in education	23
2.5.2.1	Maker spaces	23
2.5.2.2	Intelligent tutoring systems	23
2.5.3.3	Massive open online course	24
2.5.2.4	Learning tools interoperability	26
2.5.2.5	Collaborative learning spaces	27
2.5.2.6	Flipping the classroom	27
2.6	Leverage innovative technology to develop human capacity	28
2.6.1	Leverage mobile messaging technology in mass education	29
2.6.2	Leverage video games to teach and learn	30
2.6.3	Leverage social media to teach and learn	30
2.6.4	Leverage video to teach and learn	30
2.7	Summary	30

Chapter 3: Research Methodology

3.1	Introduction	32
3.2	Research design	32
3.3	Research methodology	32
3.4	Data collection techniques	33
3.5	Sampling strategy	34
3.5.1	The population	34
3.5.2	The sampling	34
3.5.3	Sampling techniques	35
3.5.4	Probability sampling	36
3.6	Data collection instruments	36
3.6.1	Construction of the questionnaire	37
3.6.2	Construction of the interview	38
3.6.3	Administering the questionnaire	39
3.6.4	Administering the interview	39
3.7	Data analysis	39
3.8	Reliability	39
3.9	Validity	40
3.10	Pilot study	41
3.11	Ethical considerations	42
3.12	Limitations	43
3.13	Summary	44

Chapter 4: Presentation, Analysis and Discussion of Results

4.1	Introduction	45
4.2	Thematic analysis of the interview	45
4.2.1	Presentation of discussion of results of the interview: analysis and interpretations	46
4.2.2	The provision of skills development to provide graduates employment	46
4.2.2.1	Perspective of industry participants	46
4.2.2.2	Strategic importance of skills development	46
4.2.2.3	Impact of skills shortage in industry	48
4.2.2.4	Impact of industry integrated experience	48
4.2.2.5	Impact of supplies and demand of quality graduates	49
4.2.3	Receptiveness towards using technology to develop skills in the workplace	51
4.2.3.1	Potency of MMT to teach and learn skills	51
4.2.3.2	The merits and de-merits of MMT in the workplace	51
4.2.3.3	Risks and compliance of information sharing using MMT	55
4.2.3.4	Strategic importance of education technology in the workplace	59
4.2.3.5	Maintain quality and standard of education using MMT	60
4.2.4	Summary of analysis and interpretation	61
4.3	Analysis of questionnaire	62
4.3.1	Presentation and discussion of results of section A	65
4.3.1.1	Analysis and interpretation of section A	69

4.3.2	Presentation and analysis of section B	70
4.3.2.1	Determining respondent's social media experience	71
4.3.2.2	Determining respondents attitude toward using mobile messaging technology in class	76
4.3.2.3	Determining perceived usefulness of mobile messaging technology as a n way of teaching and learning	85
4.3.2.4	Determining perceived ease of use of mobile messaging technology	89
4.3.2.5	Determining respondents intention to use mobile messaging technology	93
4.3.2.6	Determining respondents mobile messaging technology self-efficacy	96
4.3.2.7	Determining the relevance of mobile messaging technology as a new way of teaching and learning	100
4.3.4	Summary of Analysis and Interpretation	105
4.4	Summary	107

Chapter 5: Conclusions and Recommendations

5.1	Introduction	109
5.2	Findings from the literature study	109
5.3	Findings from the primary study	111
5.4	Conclusions drawn	112
5.4.1	Objective One: To investigate the impact of the business skills shortage in the FP&M sector upon FET graduates employability in the emergent economy	112
5.4.2	Objective Two: To investigate the attitudes of business studies students from a Durban FET College towards mobile messaging technology as a strategic teaching and learning tool	112

5.4.3	Objective Three: To investigate the attitudes of business studies teachers from a Durban FET College towards mobile messaging technology as a strategic teaching and learning tool	113
5.4.4	Objective Four: To investigate the effectiveness of MMT as a technique of teaching and learning using a business studies programme of a Durban FET college	113
5.5	Recommendations	113
5.5.1	Recommendation One: Expand the integration of technology into the curriculum to enable students to develop the human capital for employment in the information age	113
5.5.2	Recommendation Two: Use MMT as an educational tool to Impact students accessibility to demand-led skills essential to survive in the information age	116
5.5.3	Recommendation Three: Provide educators sufficient training and support to utilise open education technology to facilitate modern-day, demand-driven skills to meet the needs of the emerging information society	117
5.5.4	Recommendation Four: Use MMT as an informal pedagogical application to tutor students to prepare them for the transition into the world of work	120
5.6	Study limitations	121
5.7	Recommendations for future research	122
5.8	Summary	122
	Bibliography	123
	Appendices	
	Appendix A: Cover Letter	134
	Appendix B: The Interview	135
	Appendix C: The Questionnaire	137

List of Figures

4.1	Skills word tree	47
4.2	Training word tree	49
4.3	Technology word tree	52
4.4	Overall support for mobile messaging technology as a teaching and and method among students	64
4.5	Overall support for mobile messaging technology as a teaching and and method among teachers	64
4.6	Illustration of the age group of the students	66
4.7	Illustration of the age group of the teachers	66
4.8	Illustration of students monthly income	67
4.9	Illustration of teachers monthly income	67
4.10	Illustrates the type of dwelling students live in	68
4.11	Illustrates the type of dwelling teachers live in	69
4.12	Illustrates the students number 1 social media platform	71
4.13	Illustrates the teachers number 1 social media platform	72
4.14	Illustrates the students number 2 social media platform	72
4.15	Illustrates the teachers number 2 social media platform	73
4.16	Illustrates the students number 3 social media platform	73
4.17	Illustrates the teachers number 3 social media platform	74
4.18	Illustration of how much time students spend on social media every day	75
4.19	Illustration of how much time teachers spend on social media every day	76
4.20	Illustration of students attitude towards peer-to-peer teaching when a teacher is not available	77

4.21	Illustration of teachers attitude towards peer-to-peer teaching when a teacher is not available	77
4.22	Illustration of the online tools students use to communicate with their Peers	78
4.23	Illustration of the online tools teachers use to communicate with their Peers	79
4.24	Illustration of student's attitude towards their standards dropping if they Began using their mobiles to learn and teach	80
4.25	Illustration of teachers attitude towards their standards dropping if they Began using their mobiles to learn and teach	81
4.26	Illustration of the student's attitude towards being included in developing teaching material	81
4.27	Illustration of the teacher's attitude towards being included in developing teaching material	82
4.28	Illustration of the attitude towards students using mobile videos to teach and learn new skills and knowledge	83
4.29	Illustration of the attitude towards teachers using mobile videos to teach and learn new skills and knowledge	84
4.30	Illustration of how mobile messaging technology enables the student to complete a task assignment more quickly	85
4.31	Illustration of how mobile messaging technology enables the teacher to complete a task assignment more quickly	86
4.32	Illustration of how mobile messaging technology increases the students productivity in the academic setting	86
4.33	Illustration of how mobile messaging technology increases the teachers productivity in the academic setting	87
4.34	Illustration of how mobile messaging technology makes it easier for students to do their work	88
4.35	Illustration of how mobile messaging technology makes it easier for teachers to do their work	88
4.36	Illustration of how easy it is to learn to operate mobile messaging technology for the students	89
4.37	Illustration of how easy it is to learn to operate mobile messaging technology for the teachers	90

4.38	Illustration of how easy it is for the students to become skillful using mobile messaging technology	90
4.39	Illustration of how easy it is for the teachers to become skillful using mobile messaging technology	91
4.40	Illustration of how easy students find it to use mobile messaging technology to do what they want it to do	92
4.41	Illustration of how easy teachers find it to use mobile messaging technology to do what they want it to do	92
4.42	Illustration of how the students intend to use mobile messaging technology every day, whenever possible	93
4.43	Illustration of how the teachers intend to use mobile messaging technology every day, whenever possible	94
4.44	Illustration of how the students would use mobile messaging technology to do different tasks / assignments	95
4.45	Illustration of how the teachers would use mobile messaging technology to do different tasks / assignments	95
4.46	Illustration of students attitude toward completing a task / assignment using mobile messaging technology if the student had seen someone else using it before trying it themselves	96
4.47	Illustration of teachers attitude toward completing a task / assignment using mobile messaging technology if the student had seen someone else using it before trying it themselves	97
4.48	Illustration of students attitude toward completing a task / assignment easily if the student could contact someone for help using mobile messaging technology if they got stuck	98
4.49	Illustration of teachers attitude toward completing a task / assignment easily if the student could contact someone for help using mobile messaging technology if they got stuck	99
4.50	Illustration of students attitude toward completing a task / assignment using mobile messaging technology, if someone showed the student how to use it first	99
4.51	Illustration of teachers attitude toward completing a task / assignment using mobile messaging technology, if someone showed the student how to use it first	100

4.52	Illustration of the students attitude towards mobile messaging technology being important to teaching in learning	101
4.53	Illustration of the teachers attitude towards mobile messaging technology being important to teaching in learning	101
4.5.4	Illustration of the students attitude towards mobile messaging technology being needed in their class	102
4.55	Illustration of the teacher's attitude towards mobile messaging technology being needed in their class	103
4.56	Illustration of students attitude towards mobile messaging technology as a way to enhance their motivation to teach and learn	104
4.57	Illustration of teachers attitude towards mobile messaging technology as a way to enhance their motivation to teach and learn	105

List of Acronyms

BBM	BlackBerry Messenger
CSR	Classroom Response Systems
FET	Further Education Training
ICT	Information Communication Technology
MMT	Mobile Messaging Technology
FP&M	Fibre Processing and Manufacturing
DHET	Department of Higher Education and Training
DoE	Department of Education
DoC	Department of Communication
ILO	International Labour Office
AECT	Association for Education Communications and Technology
NAE	National Academy of Engineering
SSA	Sub-Saharan Africa
SETA	Sector Education Training Authority
EADI	European Association of Development Research and Training Institutes
LMS	Learning Management System
LTI	Learning Tools Interoperability
MOOC	Massive Open Online Course
OECD	Organisation for Economic Cooperation and Development
UNDP	United Nations Development Programme
WSIS	World Summit on the Information Society

CHAPTER ONE

Introduction

1.1 Introduction

Chapter 1 highlights the basis for the research study. The background underlines the history of the use of technology in education in South Africa, which presents the research problem being investigated. Consequently, the aim, objectives and the research questions are presented and describe the study while the significance of the study gives a framework of the importance of the research being undertaken and the stakeholders who would benefit from it. The conclusion closes the chapter by collectively and succinctly presenting all of the information.

1.2 Background

There are many road signs that show the unpredictable nature of South Africa's education system. Evidently, a lot more concentration needs to be focused on the application of quality education. However, quantity should also be considered, particularly on a massive scale. It has been established that there are numerous factors and challenges that hinder students from accessing quality education in the public education system in South Africa, which is a catastrophe.

It is a requirement of the South African Constitution to ensure its citizens are engaged, encouraged and well educated. Modisaotsile (2012), a research intern in the Unit of Knowledge Transfer and Skills Development at the Africa Institute of South Africa, stated that South Africa generously spend 18,5 percent of its annual budget on education. Nevertheless, the state of the South African education system continues to remain turbulent. Also, Pravin Gordhan, the Minister of Finance noted that over the past five years South Africa has doubled the education budget to a staggering ZAR 165, 1 billion.

Nonetheless, the system still continues to fail to reverse the disappointing performance in examination results, the inferior quality of education, the insufficient output rate and the lack of obligation to teach from teachers, poor encouragement for learners at home, and a shortage of resources in education, notwithstanding the large budget commitments by the government.

Sustainability and performance of South Africa's education system depends on how it's Ministers and their local, provincial and national stakeholders embrace, manage and serve the people who are in some form of education, training or development given the extent of the prevailing changes being undertaken in modern society. Globally, education systems have been criticized for being old fashioned, and have struggled to keep up with the pace of change, especially with regards to technology and innovation. Change is the very essence of growth and development - it is inevitable and unavoidable! Unfortunately, what worked in the past might not work in the future, and this is a lesson which people and sectors are experiencing subsequent to the explosion of technology and innovation in a globalised market.

The South African public education system has over the years experienced some significant changes. These changes manifest themselves in a single democratic system, new curriculum, revised national legislation and the same policies which declares that all South African learners should have access to the same quality of learning and teaching, similar facilities and equal education opportunities. However, this is not the case and is not possible. Many people, students and teachers, and their schools struggle with the lack of functioning utilities and poor access to proper infrastructure, which directly impacts on the quality of education that is available to students. This view has been supported in the work of Gardiner (2008) who argues that. Bingimlas (2009) argues that several studies recognise the significance of Information Communication Technology (ICT) in education in the future, in order to provide students the opportunities to learn to function in an information age.

Yelland's research in 2001 (cited in Bingimlas, 2009) highlights that conventional education environments are insufficient for preparing students to function or be productive in the workplace today.

The Association for Education Communications and Technology (AECT) (2004:1) defines the concept of education technology as the study and ethical practice of facilitating learning and improving performance by creating, using, and managing appropriate technological processes and resources. The use of technology in education globally has improved teaching and learning. Phurutse (2005) argues that technology is now simplifying the access to quality education and putting the appropriate tools in the hands of students and teachers.

1.3 Research problem

The South African education system is the sole source of mass public education to the end user, the student. Jansen and Taylor (2003) stated that decades of socio-education inequity in pre and post-apartheid South Africa have left a hangover of challenges and obstacles like high unemployment amongst students, inequality between former white and black schools, high dropout rates amongst mostly black students, poor quality and standard of teaching and learning, both inside and outside of the classroom environment, and an enduring poor response in education performance and lack of parental participation in school governance, which impacts the day to day running and sustainability of the public education system in South Africa.

A lack of transformation in educational policy has greatly impacted the standard of quality in basic and higher education, in South Africa. This is demonstrated in the research of Modisaotsile (2012) who stated that a number of factors impede students from receiving a quality education; namely the lack of parent's participation in their children's education, teachers who do not want to teach, and dysfunctional school governing bodies. The problem is that government has an insufficient number of schools with the adequate resources, specifically suitable ICT infrastructure and a disproportionate number of trained teachers to use technology in education to positively impact the access and standard of education in South Africa.

Therefore, it is essential to understand the major problems and challenges encountered in the current public education system.

This requires establishing new and innovative approaches of improved delivery of education services and education policy. Researchers (Barber, Donnelly and Rivzi, 2013) focused on how the Ministers of education, in the next 50 years are going to use the requirement for innovation in areas like education, social economic development, and health care to help its citizens face the problems of our time. Consequently, South Africa requires a rigorous analysis of the present state of the educational system to overcome the challenges it is facing in its classrooms with regard to its students and teachers who lack quality ICT skills to adopt new available technology (Bingimlas, 2009) into their curriculum.

This study therefore aims to evaluate in what ways lecturers and students could benefit from technology in a public FET College, and identify any opportunities for students and teachers to use technology to teach and learn in an information age.

1.4 Aim of the study

The scope of this study is to identify and recommend education management strategies on how to optimise MMT in a public FET College as an application to tutor FET students to supplement their learning experience; furthermore, to develop them for the transition into the world of work.

1.5 Research objectives

- Investigate the impact of the business skills shortage in the Fibre Processing & Manufacturing (FP&M) sector upon FET graduates employability in the emergent economy.
- To investigate the attitudes of business studies students from a Durban FET college towards MMT as an innovative technique of teaching and learning.
- To investigate the attitudes of business studies teachers from a Durban FET college towards MMT as an innovative technique of teaching and learning.
- To investigate the effectiveness of MMT as a technique of teaching and learning using a business studies programme of a Durban FET College.

1.6 Research questions

- How do industry stakeholders see the impact of the business skills shortage amongst FET graduates employability in the emergent economy?
- What are the attitudes of business studies students in FET Colleges towards the use of education technology as a strategic teaching and learning tool
- What are the attitudes of business studies teachers in FET Colleges towards the use of education technology as a strategic teaching and learning tool?
- How receptive are the business studies students in FET Colleges towards the use of education technology?

1.7 Scope and limitations of the study

The study has a narrow scope as it only covered Durban. The study did not cover the rural areas and other district areas from KwaZulu -Natal. Since the researcher did not hand out the questionnaires and collect them personally, there could be an inference that the respondents completed the questionnaire without focus and 100% attention to detail. The researcher did not observe and witness all of the questionnaires being completed therefore this could be seen as researcher legitimacy. Ideally, the researcher was unrelated to the activities being researched.

1.8 Significance of the study

The findings of the research would be aimed at the Department of Education, teachers, students and communities in South Africa, and serve as a point of reference for building capacity to purposefully use technology in education, rather than just operating it inside and outside the classroom.

Jansen and Taylor (2003) support the view that South Africa has made significant advances in the schooling sector; nonetheless a lack of capacity building in education has permitted a major obstacle to reaching the goals of educational reform in post – apartheid South Africa.

Bingimlas (2009) supports the view that the existence of teachers, students, and schools entering the information age will eventuate from their education leader's ability to connect and plan pragmatic solutions to roll out of software, hardware, and sufficient training and support for students and teachers to experiment with and use technology to develop confidence and the human capital to become more productive in the emergent economy.

The study will be applicable to those stakeholders using technology in education to drive a culture of learning in the classroom, and to start a journey of competing against the powerhouses of the rest of Africa, and the globe.

1.9 Format of the study

The research report has been organised into the following chapters:

Chapter one: Introduction

In this opening chapter, the researcher introduces the topic of the study by drawing out the contents of the research.

The background provides an indication of the challenges that hinder the provision and access to quality education in the public education system in South Africa. The research problem highlights the impact of establishing new and innovative approaches of improved delivery of education services and education policy in South Africa. The aim and significance of the research provides an understanding of how the use of education technology can be optimized in public FET Colleges to develop skilled graduates to fill core occupational fields.

Chapter two: Literature review

This chapter explores and provides the comprehensive analysis of the literature relevant to the study. The literature used and presented forms the rationale of the theoretical framework.

It includes major topics that cover key concepts that give insight into the already existing information regarding the strategic importance of education technology in schools and colleges.

Chapter three: Research methodology

This chapter specifies the research design, methodology, in addition to the data collection instruments, data analysis and ethical considerations. The chapter confirms as well as justifies the research methods used in the study and covers and explains the data collection process, data analysis techniques, and data quality issues relating to this study.

Chapter four: Presentation of analysis and results

This chapter presents the research findings, and analysis of the findings using graphs. The findings are examined, discussed, compared and linked to the literature review simultaneously.

Chapter five: Conclusion and recommendations

This chapter summarizes and covers the overall conclusions of the study. This chapter includes the presentation of recommendations to advance progression for both, the Department of Higher Education and Training (DHET) and further research.

1.10 Summary

This chapter has elaborated on the background of the study by attempting to give a viewpoint of the strategic importance of technology in education. The research problem, the aim of the study, research objectives, research questions, limitations, and significance of the study support the focus of this study. The format of the study gives a hint of the contents of the individual chapters. The following chapter covers literature gathered to form the conceptual framework for the study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Chapter two outlines the conceptual and theoretical framework for the study. The purpose of this literature review is to give some insight into the already existing information regarding the topic of the strategic importance of education technology. This chapter will begin by looking at the impact of skills shortages upon employability in general and will serve to provide readers with a rationale of the key concepts of how education stakeholders engage in education technology currently. It will define how experimenting with technology-based education innovation in mass education can develop human capacity in the information age.

2.2 Definition

It is important to get a clear understanding of the concept of education technology before uncovering the details of the literature review. The Association for Education Communications and Technology (AECT) (2004:1) defines the concept of education technology as the study and ethical practice of facilitating learning and improving performance by creating, using, and managing appropriate technological processes and resources.

2.3 The setting for Education Technology in South Africa

2.3.1 Learner motivation in the information age

While digital technology makes education possible, it remains itself perceived as an inferior way to learn by parents, schools and communities in developing countries. As highlighted by research conducted at many schools, success with integrating appropriate technology depends on the rigidity or flexibility of the school curriculum. Groff (2013) states that many are finding the need to redesign curricula models that are less prescribed and driven more by learner needs using Web 2.0 technologies.

Education leaders and providers must be encouraged to engage in ethnographic research to start gathering data pertaining to the tangible and diagnosed needs of students, and technical understanding of how young people learn in order to co-design and co-deliver better solutions to meet the [their] needs.

Lucas and Claxton (2010) in their research paper about learner motivation and engagement found that the opportunity to contribute to concepts and design of learning enables learners to choose the methods that are relevant, and excite students. However, equally, the information age heralds new possibilities and is being used to make it easier and possible for people to develop new human capital, simultaneously building up levels of demand through a richer variety of opportunities available.

2.3.2 Innovative virtual learning environments

The trend, effort and experimentation of the virtual learning platform is now getting enormous attention across the globe, and has expanded rapidly into education in developed countries. A virtual learning environment is an e-learning based education system that takes traditional in-person education by providing virtual access to instructional class content, assessment and credentialing. A virtual learning environment is one of the most popular learning platforms in the information age. So, understanding (Liaw, et al., 2006) students attitudes toward e- learning technology, including teachers and learners attitudes, enables us to make learning more effective, efficient and appealing, likewise impact upon learner motivation and engagement.

Education systems are being defined by the creation and integration of appropriate technology as a platform for many contributors, providers and players to improve teaching and learning, and in an effort to reinvent and redesign traditional learning systems to become a digital learning environment (Selwyn, 2010).

In the city-state of Singapore there are several novel ‘Future Schools’, set up as part of a cooperative effort between the Ministry of Education and Infocomm Development Authority, which have knitted technology into its curriculum, and pursue an innovative and engaged problem-based approach to school design by harnessing ICT to ensure higher levels of engagement and collaboration of their students who already have an ICT integrated lifestyle.

These schools feature computer design labs, desktops and mobile devices, and even a video production lab (Edudemic, 2014).

Nascent innovation helps to produce technologies that increase possibilities – a classic example is the creation of an inter-connected learning network for students, which enables the creation of communities of connected learners of all ages without regard for geography that spread far beyond school and involve students, parents, businessmen, and content providers that contribute and collaborate on dealing with real world problems in a global respect. In order for an education system to create a connected learning network, its investment in the creation and integration of appropriate technology need to allow for technology experimentation to be easy in schools, homes and communities, and for the design and collaboration of problem solving to be as simple and uncomplicated as possible.

In recent research Prince (2014) has found that countries are going to have to diversify and redesign a whole new kind of education system, transforming its current public education system and its intersecting architecture into a new design consistent with the emerging economy. And, furthermore, provide an informal learning system that starts to enable students, families and communities from deprived and impoverished areas to master the fundamental skills like literacy, numeracy, language (speaking skills), entrepreneurship, and technology fluency. It is these basic skills that can enable students to have a foundation to employability and economic success.

A new and improved learning system is required, one that is characterised by innovative ways of organising learning, and new methods of assessment and credentialing.

The South African education policymakers need to start working with private business, and education technologists on designing and scaling a promising occupationally directed learning model that strategically organises the supply of instructional content, world class expertise, new disciplines and knowledge via digital broadcasting of lessons, and remote inter disciplinary collaboration taught by a wider audience. These are all according to the demands upon employability of graduates in the 21st century.

2.3.3 Invest in innovative technology to transform a learning society

The South African education leaders and policymakers need to begin investing in innovative technology to supplement the traditional school system by rethinking the role of how education is run to transform the learning opportunities of students (that works for everyone), and to fulfill their requirement for constantly innovating its learning system in order to improve the barriers to learning a range of skills essential for an emerging economy.

In order for South Africa to build a learning society that is not isolated and separatist from government policy and our everyday lives, the South African education system needs to utilise new technologies to mobilise new education techniques, and to foster a cohesive learning society between learners, content providers, funders and innovators to be able to provide a platform that supports a system of continuous innovation and feedback, which delivers a balance of skills and capabilities to a population of lifelong learners.

South African education institutions need to evolve beyond traditional and conventional constraints that they operate within. Higher Education institutes in South Africa have always provided the most mainstream form of work transition training to contribute towards economic development. This is not enough anymore and has consequently impacted significantly upon the skills shortage in the labour market in the 21st century; especially by the time students reach employability. Most notably, the dominant and disruptive forces that are driving seriously profound changes in the nature and role of education in society demanding a broader range of skills, which are affecting our future, include and amongst others are, changing demographics, disruptive technology, emergent economies and globalisation.

2.4 Impact of innovation in education in South Africa

The global economy has experienced a meteoric shift in the past 10 years and it is worth investigating what steps the South African education policy makers are taking to use technology in education and training as a cost effective and easy-to-use tool to help public FET College teachers and students tackle, head-on, the constant disruption and future challenges in our economy.

Moreover, at what level are the South African education leaders (Policy Horizons Canada, 2014) building capacity to innovate to stand up against how these students will acquire a broad range of skills to prepare them for employability in an economy that is going to change in the next 10 - 15 years?

In order for South Africa to compete for global leadership in the information age [it] needs to begin initiating new factual and scientific consciousness based education to create a novel education system that is adaptable to the lives of people from designated groups and can be integrated amongst schools, families, homes and communities, and to furthermore develop engaged and productive people for employability in the next economy (Policy Horizons Canada, 2014), that is:

- Develop people's tech-digital fluency
- Train people on the requirements of global networking
- Train people to collaborate even in the context of competition
- Drive bio- ethical leadership and awareness initiatives
- Strong orientation to services and intangible goods (like online retailing)
- Critical problem solving – thinking skills
- Entrepreneurship

The challenge is that South Africa has a heterogeneous education system with a range of learning abilities, and in order for transformation to truly take place and develop a socially cohesive nation of highly trained, educated and disciplined people, it requires policy makers to encourage, penetrate and improve barriers to innovative kinds of teaching and learning. This more importantly requires a deeper understanding of the students learning abilities and attitudes towards a digital learning environment.

Leadbeater and Wong (2010) found in their research paper that radical innovation usually comes from new entrants, specifically social entrepreneurs to a market seeking to make an expensive product available to populations of poorer consumers, and that is why creating mass learning in the developing world is a radical innovation challenge.

Obami, a South African educational technology startup based in Cape Town, is a social learning platform that lets school children and school communities connect, create, share and learn. Obami (2014) has recently launched its new mobile tutoring service, which aims to help connect students to qualified mentors using their mobile phones.

2.4.1 Experimentation with technology - based education innovation

The experimentation of technology in education is imperative because it can be used to teach students different ways to learn and can unlock an appetite for learning that the conventional school system often does not reach. Technology has made learning available anytime, anywhere and not just in a classroom, and more importantly, made it an enjoyable and engaging process of discovery and creativity. However, schools and teachers need to know ‘why’ they must bring technology into class and what to do with it. The use of technology in education permits students in class to reinforce their ideas by experimenting with tools over the web. Young students are naturally inquisitive and technology has enabled them to self-organize their learning using computers.

Essa Academy in Manchester, United Kingdom, uses iPads, which have enabled students to learn at their own pace and teachers to individuate learning and set up all their students to succeed (Apple, 2014). What lessons can students teach us about how the education environment needs to change to meet the needs of millions of young, disadvantaged South African’s hungry to learn but starved of opportunity?

The South African government needs to drive innovation in education to accommodate the extreme differences in access to affordable, quality education, and create an education model that attracts children, particularly children from impoverished areas, to school, and keeps students in school by making it interesting, engaging and worthwhile.

Hannon, Patton and Temperley (2011) state that a part of this paradigm shift requires leaders from the public and private sector to start working with students, families and communities to transform education systems and to start to design and scale promising learning models that allow students to identify techniques to learn, based on the students individual learning requirements, which they enjoy, and are appropriate.

Edtechteacher is an educational technology professional development provider dedicated to helping teachers use technology to create active, student-centered learning communities.

Edtechteacher (2014) indicated that governments and educators are deeply concerned with the job of how the industrialised school system, which is largely the product of the 19th century, has prepared students for the 21st century. But, increasingly they should also look to social entrepreneurs and education technologists who are researching and working with technology, and engaging with students to use disruptive innovation to remove barriers so as to access low-cost, mass participatory models of learning.

2.4.2 Significance of constructing a mass education system for the information age

The view of a mass education system, today, should be to construct a national society by preparing, organising and providing advantages of learning for its citizens, especially involving learners from designated groups with different cognitive processes to develop the competencies to make suitable choices and engage in appropriate action in the information age resulting in engaged and committed citizens.

The challenge in South Africa and its mass education system is to tackle underperformance and inequality, which is entrenched in schools and learners from poor communities. Education systems can mitigate these challenges by designing innovative kinds of education systems that create a collaborative digital learning platform that allows students to interact and share new knowledge, principles and concepts, and furthermore, by developing and managing quality education technology at low cost, on a vast scale, to facilitate learning that is appropriate for millions of people.

The South African mass education system has lacked focus and attention of the modern day skills required by students in a modern-day economy and the capacity to adapt these skills to function and compete effectively in new industries against other countries, and to occupy new roles in the business world on a global scale. In their recent research, Leadbeater and Wong (2010) suggests that the quality use of modern technology in a learning environment is powerful, especially when it permits students to develop scarce and critical cognitive, commercial and technical skills, which are particularly aligned to the South African human resource development plan over the next 10 – 15 years.

The spread and development of schools around the world, combined with the efforts to improve infrastructure is a vital priority for governments. However, this demand and expansion was the mandate of the education system from the 19th century. Soysal and Strang (1989) stated that many schools were originally developed to serve particular constituencies, and blocked the development of a unified education system. In order to prepare students for the demands of the century to come, it is just as important if not more important for schools and teachers to integrate technology into the curriculum, and give students access to experiment and use technology, interactive software and online education resources to facilitate a more progressive and interactive learning environment.

Transformation in education in South Africa has been slow and ineffective, especially for those students who have been denied the basic public services, infrastructure and learning resources in the townships and rural schools to help master cognitive, literacy and numeracy skills. These underprivileged students do not have the motivational push from their families and communities, who lack a culture of reading since many learners in South African townships and rural areas come from families affected by poverty and parents with limited education.

Research on non-governmental organisations by the European Association of Development Research and Training Institutes (EADI), (2005) has shown that NGOs have been playing a pivotal role in education of designated groups in developing countries since 1980s. These NGOs emerged as alternative providers of quality education against the backdrop of the state's failure to deliver quality education amongst the poorest people.

Education Without Borders, Say Yes to Education and Open Society Foundation are among numerous grant funded education NGO's, which offer a range of support services focused and committed on promoting the development of quality education driving the transformation, development and sustainability of poor, disadvantaged individuals and impoverished communities in predominantly developing countries.

Some of the common characteristics of former rural areas on the urban fringes are that they lack the basic public services like housing, water, electricity, sewage service, healthcare, and education.

Governmental agencies and organisations in cities of the developing world will need the radical exploitation of social innovation solutions to start expanding academic opportunities and enable access to better basic education and training, especially learning on a large scale in places that are ill-served by poor public services. Furthermore move beyond traditional pedagogical models (SSIreview, 2014) to help students develop the marketplace and entrepreneurship skills and attitudes that are relevant to improving their life's chances.

After investing huge amounts of resource in schools, particularly in infrastructure in the first half of the century, South Africa is faced with a vicious cycle mainly engendered by the lack of disruptive innovation, and lack of use and management of education technology to facilitate learning and development in state funded education. The South African government is also facing the challenge that its mass education system, which originated from the industrial era as an institutionalized model of national development (Ramirez and Boli, 1987) disguises a good education by teaching students to get through tests and national exams by memorizing a standard curriculum, and rather not provide its students with the cognitive and entrepreneurial skills that they need in order to succeed and live in an innovation driven economy.

Since 1994 the post-apartheid government has tried to remedy its past injustices by attempting extensive changes in the South African education system, including the introduction of the outcomes based education system in the late 1990s, which was the state's attempt to implement legislation to transform its mass education system and improve its inherited inequalities, which still exist in many schools and communities. Unfortunately, little transformation in education at the classroom level has ensued, specifically in underprivileged schools.

Consequently, these disadvantaged students continue to experience massive challenges and barriers to learning because of a lack of qualified and professional teacher support, much needed remedial intervention, and a lack of experimentation of technology.

South Africa's National Development Plan states that education, and training & development are not a solution to all of its problems. But, it is conceivable that the most poorly governed problem in the South African education system is its failure of mass schooling to deliver on social mobility and economic improvement for a significant number of learners.

South Africa's ability to solve problems, develop competitively, reduce poverty and prevent inequality is severely disadvantaged without its 'collective capacity' for social problem solving, democratic decision-making, and productive work.

Overtime the South African education system has designed, modified and created a formal education system that is outdated. The South African education system is going to be, if not already an inflexible, mass instructional model. These interdependent relationships of global education systems emerged as a result of historical functional education design, and as time passed on more processes were included and transformed resulting in policymakers experiencing a gargantuan task of revolutionizing a mass educational system that is inelastic against any form of change. It is important for South Africa to act quickly otherwise it will be left in the competitive dust.

2.4.3 Peer-to-Peer remedial intervention

In his recent research Van Der Berg (2011) suggested how the South African education system is failing to meet the strategic focus areas of mass education, and how has this subsequently (Cisco, 2011) had a huge bearing on people from impoverished areas being motivated to learn.

Regardless of these aforementioned challenges experienced by these disadvantaged students from rural and township schools, Fox, et al. (2007) in their earlier research paper focused on a cross-cultural peer teaching community service initiative facilitated in Port Elizabeth, South Africa between a privileged private school and a township school.

The focus of the program was to explore the advantages of cross-cultural peer teaching of the new Mathematics curriculum, and to investigate whether the township learners understanding of the instructional content could be improved. The results illustrated that township students' understanding of the content dealt with during the peer tutoring sessions were improved and that both groups benefited from the cross-cultural peer teaching interaction. Cross-cultural peer tutors rearranged knowledge more effectively to enhance the students understanding of the instructional content by sharing their knowledge, ideas and experience as a means of overcoming some of the many challenges faced by students, specifically in townships and rural schools.

2.4.4 Integrate open education technology in mass education

The South African education system needs to shine a spotlight on the abundance of open educational technology being shared online including (Jisc, 2014) websites, blogs, wikis and cloud based document portals, with schools and learners, especially from weaker socio-economic backgrounds in order to achieve the best possible socio-economic outcomes for disadvantaged students. Disruptive technology in education, namely; mobile technologies, open educational resources, Massive Open Online Courses (MOOCs), cloud computing and analytics will provide for a totally different method to the current fledging mass education landscape.

These disruptive technologies are reforming the education system particularly curriculum coverage, the frequency of giving homework, which can be taken at the students own pace and in their own time, continuous assessments, and finally accurate feedback to students, which makes a huge difference to performance. The founders of Learnnovators, a company which provides innovative learning solutions based in India, suggests that these technologies are making learning more engaging and effective because they are producing something innovative and more efficient by giving these students direct access to relevant instructional content they require to solve daily problems, and prepare them in their life and career. One of the biggest challenges though will be whether education systems, especially the South African system will be to slow in adopting the emerging trend of education technology and miss out on the benefits and advantages they offer as a strategic tool to learn (Learnnovators, 2014).

2.4.5 Lack of qualified and professional teachers

Teachers employed in the South African education system should develop a strong professional commitment to collaborative, interactive forms of learning, promoting problem solving and critical thinking together with basic skills such as literacy, which has a high priority. The South African National Planning Commission (2011) stated possibly, one of the most inconceivable statistics – “that teacher’s in black schools teach on average 3.5 hours a day compared with significant 6.5 hours a day in former white schools”.

To achieve this professional culture, the schools need to be run by qualified and competent principals who facilitate a disciplined and vibrant environment to learn. One of the keys to tackling ingrained failure in South African education in order to drive high performance is to attract good people into teaching, which needs to start being treated as a highly recognized profession.

The DoE (2011) stated in its technical report that over the past 15 years the image of the teaching profession in South Africa has deteriorated markedly and this has had a negative effect on the supply of new teachers, compounded by poor government public relations and information dissemination. In order for these teachers to be successful, there needs to be an institutional structure incorporating bursary programmes for existing teachers that promotes good teaching by attracting, investing in and retaining the best teachers.

In 2009/2010 the budgetary resources estimated to be available for professional teacher training and development, where individual teachers could access funding opportunities was at least ZAR 1.124 billion. The supply and efficient utilisation of new teachers is also being negatively affected by the fact that demand is being inappropriately satisfied through the continued hiring of unqualified people to fill teaching posts. This may be compounded by the lack of a budget or insufficient capacity to manage budgets since more unqualified people can be hired on less money than it would take to hire qualified teachers. (DoE, 2011)

The degree of skill at which teachers, specifically public school teachers use technology in South African classrooms reflect how much they know about the potential of technology and their limitations in experimenting with, and introducing it into their learning activities.

Ndlovu and Lawrence (2012) discuss how the ICT policy drafted by the government has been poorly implemented, especially intended for those it has tried to rescue from economic and social discrimination caused by the digital divide. South Africa needs to overcome the challenges it is facing in its classrooms with regard to its teachers who lack quality ICT skills to adopt new available technology into their curriculum in order to effectively promote the advancement of computer literacy, technology fluency and global networking amongst its students, in preparing them for their occupational field. Notwithstanding, Ndlovu and Lawrence's argument is about how teachers are not technically equipped and do not have the ICT skills to adopt the available technology in their teaching to start encouraging the development of computer literacy skills and technology fluency amongst their students.

The Department of Communication's (DoC) (2012) strategic plan presentation proposed to implement the universal access and services supply to more than 1 650 schools with internet connection, and to train and build capacity in ICT skills targeting historically disadvantaged students in an effort to boost the skills output in the ICT environment.

Even for those students who persevere to the end do not build up the human capital consistent with the level of instruction reached, nor measure up to the human capital requirements of the fiercely competitive labour market, which requires an ever more skilled workforce, which is driven by forces like revolutionary innovation in ICT, transport and logistics allowing the development of global markets to compete.

2.5 Mass learning using the web

2.5.1 Technology in education is shifting learning

An education system designed to impart a body of knowledge that is decided upon in a top down way seems hopelessly cumbersome for a world in which new information is emerging the whole time on the web.

Earlier research undertaken in Hong Kong supported in the work by Duffy (2008) and recent research by Brinthaupt, et al. (2011) states that the use of new Web 2.0 technologies like blogs, messaging boards, discussion forums, chats, wikis and You Tube have become increasingly popular as a means for students to learn from each other, and these digital tools are changing the nature and demand of learning. Moreover, they provide new support to learning even if they dismantle some of the learning supports upon which the education system has depended in the past.

There are changes occurring in the global learning society, specifically in the demand to use these emerging technologies to learn. It is essential for governments to accelerate their thinking regarding the application and integration of Web 2.0, and mobile technology as a new tool within its mass education system. These tools have enabled student learning to flourish through engaging discussion, reflective thinking, and knowledge construction. Young people increasingly see themselves as participants in creating knowledge and ideas, not merely as spectators.

The integration of Web 3.0 technology and mobile technology into connected learning is one of the many contributing factors that have created a shift in learning in higher education. Connected learning allows the ability to link people, courses and resources to develop curriculum and educational activities to become more unique and personalized. It also works in a way that individual learners, instructors and advisors organise, structure and use resources in unique and personal ways to accomplish particular learning goals (Educase, 2012). An underlying and common threat is the pressure from those that have limited computer literacy skills because of their lack of experience in the digital environment.

Barber, Donnelly and Rizvi (2013) examine how the future of the Atlantic and Pacific global leadership in education is focusing on, how in the next 50 years Ministers of education are going to use its requirement for innovation to help its citizens face the problems of our time. These authors illustrate how the future for countries who do not choose to accelerate growth in major scientific and technological areas look very bleak, and for a country like South Africa to build a successful economy, it needs to include an engaged and commercially skilled labour force.

The Organisation for Economic Cooperation and Development (OECD) blog (oecdeducationtoday, 2014) discusses existing and emerging issues in education and skills for the 21st century and states how students need to be taught in school, homes and communities how to construct the human capital for curiosity, collaboration, and creativity through the use of the web to enable them to search for information accurately, evaluate the quality of the information, and know how to share it in many directions. The South African education system needs to develop a deeper understanding of how technology is systematically changing education, and its policymakers need to start to take a stand against the challenges it currently faces by thinking abundantly about investing in and implementing technology in education to facilitate new mass schooling.

2.5.2 Exploitation of modern technology in education

In the future, the mass schooling system may possibly be a virtual schooling environment that provides and creates opportunities for students to participate and engage in solving problems in real-life situations with lots of peer-to-peer feedback and collaboration but sticking to the ‘rules of the road’. This exploitation of technology in education will put a premium on the students with the social and cognitive capabilities to search, sift and share information in a generation of connectivity rather than students that memorise a standard curriculum.

Senior education leaders and policymakers in the South African education system need to combine their efforts, and work closer with social entrepreneurs, supporting and investing in them to create a mass schooling system, specifically a virtual) schooling environment through using technology incorporating computers, the web and mobile phones, which is designed to teach a non-standardised curriculum linked to the appropriate human capital that these students need, which is suited to the work conditions in their everyday lives, so that they can practice tackling these challenges without using formally qualified teachers. Educational technologists like Salman Khan’s website (Khan Academy, 2014) offer access to free education to learners using computer-generated problems tailored to specifically work (tutoring) one –on-one with learners.

South Africa’s education stakeholders need to radically innovate the current challenges the traditional mass school system is confronted with.

ne way is to create inroads with social entrepreneurs to invent new kinds of schools that are learning hubs, which weave modern technology, especially the web and video into the mix making learning captivating and enjoyable thus, giving new possibilities to stimulate students and the emergent school system.

Currently, technology supported learning is recognised as one of the biggest key drivers that is transforming the way individuals learn in the 21st century. These transformations have influenced the move away from the classroom based teaching syndrome and created open access to informal learning to students who want to develop and acquire new and relevant knowledge on demand. Informal learning is a non-course learning activity used to enable realistic, hands on experience, and to learn beyond the classroom. It provides the student more exciting and interesting opportunities to participate in life's challenges, and to understand and discover the consequences of failure and real achievement, and to stay motivated and encouraged to pull through.

2.5.2.1 Makerspaces

Makerspaces are self-directed learning zones where people gather to share resources and knowledge, work, and build research projects in hands on approach are growing in demand globally in universities, public libraries and community centers. These spaces encourage different campuses to link up to jointly work on and review projects. Eventually these spaces may become linked from campus to campus (Educase, 2013) encouraging a collaborative technique of teaching and learning.

2.5.2.2 Intelligent tutoring systems

The implementation of intelligent tutoring systems is attempting to capture the best methods of the traditional human model Educase (2013) and moving above and beyond to discover new ways for teaching and learning. The system is developed to simulate supervision and create a more effective approach for struggling learners to help understand the problem.

The systems artificial intelligence flags any spots where the learner is not yet competent in their understanding of the problem, recording both, correct and incorrect responses, computing an analysis to estimate the individual students mastery in the areas of his understanding of the problem.

In the United States, there has been a remarkable development in open education resources where a number of tertiary institutions have decided to set up sharing sites for educational resources, making learning activities and course material freely available for teachers and students online (Godwin Jones, 2012). Leading higher education institutions around the world have used technology to develop open educational resources that offer learning and teaching material for free, for anyone, anywhere to use. Teachers and students have access and make use of these education resources online removing their demographic, economic, and geographic location.

Likewise, the advent of innovative and disruptive education technologies like smart phones, digital textbooks and MOOCs powered by cloud computing technology are performing a crucial role in the learning scenario of the future. These education technologies have ushered in an era of global access to cost effective higher education, which is greatly improving the potential barriers to education and the quest for new learning techniques. These technologies have helped improve the capacity and reliability of a global learning network, which has given rise to a booming culture of online collaboration and social networking, and an emergence of user generated content. These innovative technologies have enabled learners to learn, create and share knowledge in the presence of their friends, peers and educators.

2.5.2.3 Massive open online course

There has been a great deal of sustaining innovation in education: exercise books and pens replaced slates and chalk; interactive whiteboards are replacing blackboards. A sustaining innovation improves an existing organisation or product by making it more effective.

In 2011, the individual roles of higher education and students worldwide were brought into question by the inception of the MOOC. International MOOC platforms such as Coursera, edX and Udacity have partnered with 33 universities offering more than 200 free courses to over two million students in 196 countries (Forsey and Riley, 2013).

In 2012, Fazackerley suggested that courses offered had attracted enrolments of up to 160 000 students. With regard to technology and the role of the MOOC, Glance, Forsey and Riley (2013) suggest that the format concentrates on micro lectures, automated assessment and open online forums properly designed to facilitate the development of discussion skills amongst students.

The author describes the evolution of these open educational resources like MOOCs as an online gathering of people with no prior connection who share an open and connected way of thinking and allow for participants to have more choice in their learning preferences, and are able to participate in courses whenever from wherever. The MOOC format demonstrates a new possible approach that is fit for time and location independency and collaborative learning. MOOCs allow people to network amongst each other to share domain knowledge (Waard, et al., 2011) and practice content-based activities for a short period of time.

MOOCs are attempting to change the cost equation of putting high quality university level courses online (Martin, 2012) and running it unattended many times. It carries no fee other than connectivity and a pre-defined interest to engage in these online courses. The author clearly states that MOOCs will have an impact on education because these courses consist of lectures that are broken up into short videos (most videos have embedded questions and answer forms), and the back end server keeps records and analysis of scores of student's homework and results. This shows how a variety of technological resources and process like MOOCs, connected learning and intelligent tutoring systems are currently reshaping teaching and learning.

The fundamentals of MOOCs have consequently drawn the attention of senior leadership in higher education because of its ability to produce 'micro lectures' for large-scale audiences and generate vast amounts of data that will raise important discussions about curriculum design, and what constitutes a valid learning experience to achieve mastery in open online formats. Educase (2013) stated that the development and availability of online learning tools such as MOOCs have ushered in an era of global access to cost effective higher education greatly improving the potential barriers to education.

Disruptive innovations in the South African education system should not be measured by how technical and complex the solutions created are but rather measured on re-focusing and changing to be fit for purpose against the relentless socio-economic environmental challenges that exist. Many successful and pioneering programmes use existing and easily accessible technologies that are simple to use and simple to understand. There is a unanimous call for new design on how to use and manage open education technology to facilitate learning, performance and content development in education, particularly for South African students who are less experienced in online activities since these digital learning management systems contribute little to the limited computer literacy for their personal lives and work.

In their recent research Glance, Martin, and Riley (2013) suggest that there is no reason to believe that MOOCs are any less effective learning experiences than their face –to- face counterparts. The authors said that it is worth investigating how taking a collection of MOOCs could replace obtaining an education on campus at a university.

Educators are beginning to work with videogame designers to create programmes that allow students to take on roles in society by applying ‘game dynamics’ to learn more widely. Chen and Hwang (2014) found in their recent research paper that digital game based learning has been widely recognized as an effective approach in promoting student’s learning motivation, which is an important factor of improving students’ learning performance. Several studies have reported the effectiveness of educational computer games in enhancing the learning interest of students, and that they are able to provide a more interesting and challenging learning environment for acquiring knowledge. (Hwang et al. 2012)

2.5.2.4 Learning tools interoperability

Learning tools interoperability (LTI) technology has been designed to enable plug in and play integration and installation of education applications and tools within higher education institutions. The outcome of this approach is that LTI is allowing instructors to select and integrate applications to a ‘do- it- yourself’ environment, which changes the role and relationship with IT staff (Educase, 2012).

LTI enables higher education provider's rapid and seamless integration of most or all of the IT specifications to personalizing their courses by choosing specific learning tools that the faculty staff or students prefer and can quickly integrate into their networks.

2.5.2.5 Collaborative learning spaces

Other innovations in education that currently exist are collaborative learning spaces, which accommodate students to sit in smaller groups and allow the instructor to move with ease from group to group. Educase (2013) states that these spaces encourage students to develop a more active inquiry of their tasks, and enable students to become more actively engaged and involved to improve their learning ability and content knowledge. It is important to examine how this concept of collaborative learning can be applied and enabled through technology to have a much greater scale and reach. The challenge will be the cost of redesigning curricula to fit the collaborative learning spaces and become familiar with how new education technology options can be best used to ensure the efficacy and engagement of these collaborative spaces.

2.5.2.6 Flipping the classroom

This can be achieved through the provision of a new pedagogical model that uses technology, and promotes learner – mentor relationships using an integrated mix of informal and formal learning. Berret (2012) says flipping the classroom can improve the traditional lecture creating interactive engagement, and just in time teaching. The flipped classroom model splits students into small groups to promote a variety of ways to think of a problem instead of your own way. Students are in control and gather the information about a problem outside of the class and answer web-based questions, and then solve these problems with their instructor and peers in class receiving expert feedback of their understanding of key concepts.

The immediacy of teaching and learning this way enables student's misconception to be corrected before they emerge in a final exam.

In recent research Godwin-Jones (2012) discusses how the overall design of a Learning Management System (LMS) like Moodle, Edmodo and Blackboard have their certain self contained pedagogical technique, and that the use of LMS is evolving and changing the way how structures and features required to build courses and get course content up online quickly and cost effectively. LMS are improving how teachers can use digital educational tools and web based applications in their curriculum to assess and grade students, and improve how students can use technology to sharpen their skills and knowledge.

Social entrepreneurs respond quickly to the current shortcomings in the contemporary mass school system, responding with big innovative technology that might change how entire schools, families and communities facilitate learning beyond the classroom syndrome. The OECD (2011) state that despite the growing trends towards innovation as a tool to tackle social problems, social entrepreneurs, who are often ahead of where government schools systems need to be are proving to be more necessary and essential to facilitate innovation but still have to be fully recognized and supported by the government. Nevertheless, it is extremely difficult to turn schools and, especially parents who are easily worried about standards dropping towards using disruptive innovation, and also teachers who are traditional and can be hostile to innovation that makes their jobs more difficult and demanding.

2.6 Leverage innovative technology to develop human capacity

The advancement of the information age has been driven by the power of an easily accessible network to connect, which has resulted in the creation of a knowledge-based society. Subsequently, this has changed the nature of learning globally by empowering teachers and learners to collaborate and share information using the full power of interactive digital media and mobility.

The DoE will invest and fund ZAR 254 billion (South Africa.info, 2014) towards education and training. Conversely, the DoE needs to reinvent itself against the challenges it faces, typically its students who are ill prepared, discouraged and falling out of the education system.

The spread of the web, particularly through mobile phones would allow more people than ever to access instructional information and relevant knowledge in their mother tongue, and expertise from skilled teachers and their peers, to participate in discussion, and to learn by their own discovery. The potential for learning through mobile phones is only just beginning to emerge.

2.6.1 Leverage mobile messaging technology in mass education

Using the suitable disruptive technology to reinvent open mass learning is a radical innovation challenge, particularly in South Africa. However, using the web through technology in schools abroad has already started to inspire new kinds of educational applications and methods like mobile messaging as a pedagogical technique.

Although a quick fix in South African education is required, senior education leaders who are driving education policy need to establish that unregulated approaches to training and education are a recipe for inferior, second-class education for the poorer people. Social entrepreneurs are not a complete solution to all skills shortages upon student's employability in the labour market, however they provide leaders with abundant mindsets about new ways of mass schooling for students.

In their previous research, the OECD (2010) suggested that educators and education policymakers should consider the growing relevance and implications of technology, and technology based education innovations, which are used on a mobile platform. Technology can perform several key functions in the change process, especially with the advent of customizing learning to individual learner needs. South Africa is experiencing a change of the tide through new ubiquitous technologies that demand new skills and deliver new challenges. Groff (2013) supports the view that whilst many education systems seek to improve and develop, it does not mean one has to leverage technology to do so. However, technology will enrich students ability to learn, and assist them to deal with the modern times challenges.

Disruptive technology is arguably one of the key drivers of change in mass education and is an integral part to accessing the higher order competences. Digital technology has transformed what young people need to learn and expanded how they can learn because it has increased the access to a superabundance of information, networks and communication via mobile devices, creating massive opportunities.

2.6.2 Leverage video games to teach and learn

An educational game series called Global Conflicts (2014) is used for teaching citizenship, geography and media courses, in which students carry out project based missions in computer games. Students who live in a developing country like South Africa have to start developing the human capital to survive the rapid and disruptive changes taking place in technology, industry, economics and society.

2.6.3 Leverage social media to teach and learn

Schools can even take advantage of the current opportunities that exist online, by harnessing social media tools like Facebook to run school projects and quizzes. At the Science Leadership Academy in the USA, students run their own science groups on Facebook. The online opportunities created by social networking tools like Facebook can become virtual teaching and learning repositories for short instructional video communication, which other students and teachers can contribute to leading too much greater personalization. These programmes create real world learning with virtual reality and online social networking.

2.6.4 Leverage video to teach and learn

Video communication is another technological enabler that is becoming a staple tool in education today, and is currently embedded in large-scale degree programmes. Video interaction can make learning a close one-on-one human experience. It is the continual improvement of these technologies that is enabling students and instructors to meet online to share and discuss, troubleshoot or diagnose any problems and issues that the student may have in real time (Educase, 2013).

The downside is that computer illiterate people may need help in using video communication.

2.7 Summary

The nature and demand of education is seriously shifting due to the changing workforce and technological needs of a global knowledge economy. Globalisation and the evolution of new technology will continue to impact and affect the pervasive flow of instructional content initiating a massive open online education market.

The introduction of new technology in education is ushering in a new era of opportunities, namely; global access to high quality, cost effective education, , which will assist developed and developing countries to become economic powerhouses. Nonetheless, the South African government must provide sustainable funding and strong, rigorous stewardship of new ways to innovate its current mass education system to persist the short-term trials and tribulations of a burgeoning information age.

These evolutionary technologies are improving upon the traditional pedagogy and are accommodating students who live, work and learn in the digital age. However, these technologies must not be a separate activity of government, and they need to be drawn to the attention of senior leadership in education, and also require the full participation with new role players, in all sectors.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

Chapter three presents the concept of research and focuses on the manner in which the research was collected. In this chapter, the research design and research methodology is explained and the reason for the choice of each. The organizing and the collection of the data is outlined in relation to the reliability and validity. The researcher expounds on the data analysis and the types of statistical methods used in the research.

3.2 Research design

Sekaran and Bougie (2013: 2) describe business research as a way to observe an area where a specific problem exists in the work setting. Business research is made up of a series of steps, which are designed and executed with the aim of finding solutions to the specific problem. Once a solution to a specific problem is clearly defined, a series of steps need to be taken to determine the factors that are related with the specific problem, gather information and analyse the data, and then solve the specific problem by taking the required measures (Sekaran and Bougie, 2013).

3.3 Research methodology

Research methodology has many dimensions that form a detailed plan of the study. Kothari (2004:8) states that research methodology shapes the manner in which the research will be undertaken; considering the logic behind the methods the researcher used in the context of the research study, and explain why the researcher used a particular method or technique, and why the researcher is not using others so that the research results are capable of being evaluated either by the researcher himself or by others.

Sekaran and Bougie (2013: 2) state that research methodology involves identifying a problem, the process to be taken to define the factors that are associated with the problem, gathering information, and the analysing the data and solving it by taking the necessary corrective measures.

The research was undertaken to principally make a contribution to existing knowledge. The researcher intended to generate knowledge by trying to understand how certain problems that exist can be solved.

This study used a diagnostic research methodology. A diagnostic research methodology is an investigation to assist in the analysis of a specific problem, why it is occurring and what can be done to prevent it from occurring. It identifies a cause and a solution for a given problem (Krishnaswami and Ranganatham, 2007). This supports what the researcher utilised to answer the research questions.

The researcher used MMT, specifically WhatsApp as an application to tutor students from a public FET College in Durban. The researcher carried out an assessment on the students to distinguish their proficiency of a specific module in the business studies curriculum.

3.4 Data collection techniques

There are, broadly speaking, two types of research methods used in research; namely, quantitative and qualitative.

Quantitative data is typically numerical; at least the methods used to analyse it are numerical. Saunders et al. (2009: 151) point out that quantitative is predominantly used as a synonym for any data collection technique (such as a questionnaire) or data analysis procedure (such as graphs or summary statistics) that generates or uses numerical data.

Qualitative data focuses on non-numeric data. Saunders et al. (2009: 151) point out that qualitative is used predominantly as a synonym for any data collection technique (such as an interview) or data analysis procedure (such as categorising data) that generates or use non-numerical data.

The researcher has selected mixed methods because mixed methods is a far more comprehensive approach since it tackles the research challenge from more than one perspective, allowing for triangulation of findings. Saunders et al. (2009: 152) notes that mixed method research uses quantitative and qualitative data collection techniques and analysis procedures either at the same time (parallel) or one after the other (sequential) but does not combine them.

Creswell & Plano's research in 2011 (cited Creswell, 2012) outlines mixed methods research design as a procedure for collecting, analysing, and 'mixing' both quantitative and qualitative research and methods in a single study to understand a research problem.

The study utilises both descriptive and inferential statistics.

3.5 Sampling strategy

3.5.1 The population

Sekaran and Bougie (2013: 240) refer to the term population as the entire group of people, events, or things of interest that the researcher wishes to investigate, and to make inferences.

The population is twofold. The population comprises all business professionals and stakeholders in the relevant field in South Africa.

Furthermore, technically, in an ultimate sense the target population here is FET College students and teachers, or perhaps more narrowly, FET College students and teachers in the greater Durban area.

3.5.2 The sampling

Sekaran and Bougie (2013: 245) state sampling is the process of selecting a sufficient number of the right elements from the population, so that a study of the sample and an understanding of its properties or characteristics make it possible for us to generalize such properties or characteristics to the population elements.

Sekaran and Bougie (2013: 240) state that a sample is a subset of the population. It comprises some members selected from it. In other words, some, but not all, elements of the population form the sample.

The researcher generated a list of 5 provincially based business stakeholders to interview. The list of professionals included an HR specialist, clothing and textile entrepreneur, a skills development and training expert, the head of leadership and training of a bank, and a research consultant in national skills planning.

Furthermore, a list of business studies students and business studies teachers was derived from the financial management faculty of one particular FET College. Due to resource and logistical constraints the researcher limited the study population to 180 students and seven teachers from the Thekwini FET College CENTEC campus. By studying the sample, the researcher should be able to draw conclusions that are generalizable to the population of interest, assuming the sample is an accurate representation of the population.

Saunders et al. (2009: 212) state that sampling provides a vital alternative to a census when:

- It would be impracticable for you to survey the entire population
- Your budget constraints prevent you from surveying the entire population
- Your time constraints prevent you from surveying the entire population
- You have collected all the data but need the results quickly

3.5.3 Sampling techniques

Saunders et al. (2009: 213) state that there are two types of sampling techniques available.

These are:

- Probability or representative sampling
- Non-probability sampling, judgmental sampling or systematic sampling

3.5.4 Probability sampling

Saunders et al. (2009: 213) state that with probability samples the chance, or probability, of each case being selected from the population is known and is usually equal for all cases. Individual units from the population are then selected at random according to the probabilities and assigned to the sample. One can sample with replacement (meaning that it is possible for the same unit to occur more than once in the sample) or without replacement (meaning that a particular unit cannot occur more than once in the sample). In human subjects research, sampling without replacement is usually used.

Saunders et al. (2009: 213) suggest that there are five main techniques that can be used to select a probability sample namely, simple random sampling systematic sampling, stratified sampling, random sampling, cluster sampling and multi stage sampling

Sekaran and Bougie (2013: 247) state when elements in the population have a known, non-zero chance of being chosen as subjects in the sample, we resort to a probability sampling design.

Probability sampling can be either restricted (simple random sampling) or restricted (complex probability sampling) in nature.

3.6 Data collection instruments

Sekaran and Bougie (2013: 116) note that interviewing; observing people and phenomena, and administering questionnaires are the three main data collection methods in survey research.

Fink's research in 2003 (cited in Sekaran and Bougie (2013: 102) states a survey is a system for collecting information from or about people to describe, compare, or explain their knowledge, attitudes, and behaviour. Cooper and Schindler (2014: 295) found that the questionnaire is the most common data collection instrument in business research. Sekaran and Bougie (2013: 102) point out that the questions in survey instruments are typically arranged into self-administered questionnaires that a respondent completes on his/her own, either on paper or via the computer.

The researcher worked closely with the FET College principal and the senior lecturer from the business studies faculty to recruit the respondents. The senior lecturer provided the researcher with the business studies faculty register, and the researcher conducted a random sampling approach to recruit the respondents.

The researcher used self-administered questionnaires to collect primary data. Sekaran and Bougie (2013: 147) state that administering questionnaires to a large number of people at the same time is cost effective and saves time rather than having to interview; equally, it does not require as much skill to administer a questionnaire as it does to conduct interviews. The sample was contacted personally to introduce the study. There was a 100% response rate recorded. All of the respondents agreed to complete the questionnaire, and returned it instantly.

The researcher likewise selected 5 reputable business professional from greater Durban to interview. The respondents were selected on their rank and position within industry. The sample of five people was contacted personally to introduce the study. The researcher likewise used semi - structured interviews to collect primary data. Sekaran and Bougie (2013: 116) found that although interviewing has the advantage of flexibility in terms of adapting, adopting, and changing the questions as the researcher proceeds with the interviews, questionnaires have the advantage of obtaining data more efficiently in terms of researcher time, energy and costs.

The questionnaire and the interview, as depicted in Appendix B and C were accompanied by a cover letter. The cover letter, as depicted in appendix A, outlines the aim of the survey.

3.6.1 Construction of the questionnaire

According to Saunders et al. (2009: 371) the internal validity and reliability of the data you collect and the response rate you achieve depend, to a large extent, on the design of your questions, the structure of your questionnaire, and the rigor of your pilot testing.

Cooper and Schindler's research in 2008 (cited in Saunders et al. 2009: 373) notes that when discussing the validity of a questionnaire, researchers refer to content validity, criterion-related validity and construct validity.

Saunders et al. (2009: 374) note that clear wording of questions using terms that are likely to be familiar to, and understood by respondents can improve the validity and reliability of the questionnaire. The questionnaire contains closed questions, which is usually quicker and easier to answer, and requires minimal writing. Cooper and Schindler (2014: 302) state that structured questions, often called closed questions, present the participant with a fixed set of choices.

There are two sections to the questionnaire. Section A covers demographic data in the form of list questions, while section B covers rating questions. Section A contains 4 questions while section B contains 21 questions.

Saunders et al. (2009: 378) note that rating questions are often used to collect opinion data. The questionnaire used the Likert-style scale in which the respondent is asked how strongly she or he agrees or disagrees with a statement or series of statements on a five point rating scale.

3.6.2 Construction of the interview

Saunders et al. (2009: 319) notes in their research that interviews may be categorized as structured interviews, semi-structured interviews and unstructured or in-depth interviews.

The researcher utilised semi - structured interviews in this study. Saunders et al. (2009: 320) stated that in a semi structured interview the researcher will have a list of themes and questions to be covered. The researcher read out each question (depending on the flow of the conversation) and the interviewees responded. Although the interviewees agreed to participate in the interview, many chose to not answer and discuss a topic being because this could lead to further probing from the researcher, which could intrude on personal and sensitive information that the interviewee does not wish to divulge. Saunders et al. (2009: 320) says that the outcome of this may result in interviewee bias.

The researcher discussed the aim of the study with the participants, and provided a 'picture' of the situation that highlights the interviewee's position within the study, so as to make the interviewee feel relaxed in order to proceed to work in a positive manner. The aim of the study was to experiment with the use of MTT as a tool to tutor students to improve their proficiency in business studies.

3.6.3 Administering the questionnaire

180 questionnaires were distributed with the assistance of the senior lecturer from the business studies faculty.

3.6.4 Administering the interview

The researcher met with the 5 industry stakeholder, after working hours, to introduce the research and indicate the aim of the study.

3.7 Data analysis

According to Sekaran and Bougie (2013: 276) after the data is obtained through questionnaires, they need to be coded, keyed in, and edited to see if the hypotheses that were generated have been supported.

Once all questionnaires were completed, the researcher coded and handed over the data derived from the questionnaire to the statistician for their analysis. The statistician used a statistical computing package called R, version 3.0.1. Graphs were used to illustrate the frequency distribution of the data.

Once all interviews were completed, the researcher typed out all of the transcripts, and handed over the data to the statistician for their analysis. The statistician used Nvivo 10.

3.8 Reliability

Cooper and Schindler (2014: 260) define reliability as consistent results; it is a necessary contributor to validity but is not a sufficient condition for validity. In other words reliability is concerned with estimates of the degree to which a measurement is free from random or unstable error. There are three forms of reliability, namely: stability, equivalence and internal consistency Cooper and Schindler (2014).

Cooper and Schindler (2014: 260) outline 3 approaches to estimating reliability: This includes:

1. Test – Retest. The reliability of a test or instrument inferred from examinee scores. The same test is administered twice to the same subjects over an interval of less than six months.

2. Parallel Forms. The degree to which alternative forms of the same measure produce same or similar results; administered simultaneously or with a delay. Interrater estimates the similarity of judges' observation or scores.
3. Cronbach's Alpha. The degree to which instrument items are homogenous and reflect the same underlying construct(s).

Saunders et al. (2009: 156) defines reliability as the extent to which your data collection techniques or analysis procedures will yield consistent findings. Easterby-Smith et al. research in 2008 (cited in Saunders et al., 2009:156) poses the following three questions. These are:

- Will the measures yield the same results on other occasions?
- Will other observers reach similar observations?
- Is there transparency in how sense was made from the raw data?

Robson's research in 2002 (cited in Saunders et al., 2007: 149) identifies four possible threats to reliability namely: subject or participant error; subject or participant bias; observer error; and observer bias.

3.9 Validity

Saunders et al. (2007: 149) states that validity is concerned with whether the findings are really about what they appear to be about. Is the relationship between two variables a causal relationship?

Cooper and Schindler (2007: 257) note that internal validity is limited to the ability of a research instrument to measure what it is purported to measure. The researchers point out that one widely accepted classification of validity consists of three major forms: These three types of validity include:

1. Construct validity. This attempts to identify the underlying construct(s) being measured and determine how well the test represents it (them). Sekaran and Bougie (2013: 227) states that this testifies to how well the results obtained from the use of the measure fit the theories around which test is designed.

The researchers state that this is assessed through convergent and discriminant validity. Convergent validity is established when the scores obtained with two different instruments measuring the same concept are highly correlated. Discriminant validity is established when, based on theory, two variables are predicted to be uncorrelated, and the scores obtained by measuring them are indeed empirically found to be so.

2. Content validity. This refers to the degree which the content of the items adequately represents the universe of all relevant items under study. Sekaran and Bougie (2013: 226) state that content validity ensures that the measure includes an adequate and representative set of items that tap the concept. Content validity was undertaken as my supervisor analysed my research questions and recommended what required to be changed in order to cover the research questions and objectives.
3. Criterion related validity. This refers to the degree to which the predictor is adequate in capturing the relevant aspects of the criterion. Sekaran and Bougie (2013: 226) state that criterion related validity is established when the measure differentiates individuals on a criterion it is expected to predict.

Robson's research in 2002 (cited in Saunders et al., 2007: 150) has chartered the threats to validity, which provides a useful way of thinking about this important topic. These include: history, testing, instrumentation, mortality, maturation, and ambiguity about causal direction.

3.10 Pilot study

Cooper and Schindler (2007: 199) point out that pilot testing is intended to reveal errors in the design and improper control of extraneous or environmental conditions. Pre testing the instruments permits refinement before the final test

The pilot study was initiated after the questionnaire was administered to actively assess the effectiveness of MMT as a tool to teach and learn.

The researcher partitioned a sample of 40 students into two groups: a treatment group (who received tutoring on a particular module using WhatsApp), and a control group (who were taught the same module using the conventional teaching method). The use of a control group allows a reference point to which one can compare the treatment group and thus assess its effectiveness.

The participants were randomly partitioned, using judgment sampling, into the two groups so that it can reasonably be assumed that there were no fundamentally different characteristics between the two groups that might otherwise explain differences in performance on the assessment. For instance, had the researcher asked 20 students to volunteer to participate in the intervention, it is likely that the intervention group would have included students who were more keen and ambitious. These qualities might have led the students to perform better than the control group on the assessment regardless of the effectiveness of the intervention.

Hence the randomization makes it more likely that any significant differences observed in assessment performance between the two groups can be attributed to the intervention.

The results of the intervention were inconclusive due to poor student input and participation.

3.11 Ethical considerations

Saunders et al. (2009: 184) states that one has to ensure that the way they design their research is both methodologically sound and morally defensible to all those who are involved.

Saunders et al. (2009: 185) stated that a number of key ethical issues arise during the various stages and duration of a research project. These relate to:

- Privacy of possible and actual participants
- Voluntary nature of participation and the right to withdraw from the process
- Consent and possible deception of participants
- Maintenance of the confidentiality of data provided by individuals
- Reactions of participants to the way in which you seek to collect data

- Effects on participants of the way in which you use, analyse and report your data
- Behaviour and objectivity of you as a researcher

Participants were assured in the cover letter that their involvement in the research is voluntary. Furthermore, participants were assured that the utmost confidentiality will be preserved, regarding the way in which the respondent's data is collected, analysed and reported. The participants were not asked for personal private information in the questionnaire, and their identity remains anonymous.

All participants' information provided will be handled responsibly and with the strictest of confidence.

3.12 Limitations

The limitations of the research describe situations and circumstances that may affect or restrict your methods and analysis of research data. Limitations are influences that the researcher cannot control.

The following limitations have been identified:

Generalisation

- The researcher cannot generalize the results from the study because the researcher only focused on one department from one FET College, and therefore cannot draw a broad conclusion from South Africa in general, or FET colleges in general

Reliability

- The low Cronbach alpha score calls into question the reliability of the data collection instrument

Bias

- Measurement bias – students misunderstanding certain terms used in the questionnaire, which may create ambiguity

3.13 Summary

This chapter has outlined the research methodology and design. The study used a mixed methods technique and follows a diagnostic approach. The population was carefully scrutinized and chosen with the sample size. Data was gathered via questionnaire and interviews, and data analysis was explained for statistical purposes.

The next chapter revolves around the statistical measurement and highlights the results.

CHAPTER FOUR

PRESENTATION, ANALYSIS AND DISCUSSION OF RESULTS

4.1 Introduction

Owing to the nature of this study, this chapter explores and analyses the qualitative and quantitative data, which culminates in the discussion of findings in relation to the study's research objectives. The intention of this study was to examine the strategic importance of education technology in a Durban based public FET College.

It has been already established in chapter 3 that the researcher has chosen to use mixed methods since it is a far more comprehensive approach used to explore and better understand the many factors of how MMT can prompt positive and effective change in South Africa's mass education system.

4.2 Thematic analysis of the interview

Braun and Clarke (2006:79) note that thematic analysis is a qualitative method, which identifies, analyses and reports themes within data. It organizes and explains your data set in rich detail. Nevertheless, it interprets various aspects of the research topic.

There is a misconception that qualitative research is inferior to quantitative research because it does not produce as much data. This is assumed incorrectly because qualitative data produces vast amounts of data.

In this study, data was collected from interviews conducted with 5 industry stakeholders that hold managerial positions in different companies in Durban, South Africa. The transcripts provided the researcher with a descriptive record, but no explanations. The researcher had to make sense of the vast amounts of data by filtering and interpreting it. The researcher followed an inductive thematic analysis approach, whereby codes, or as Nvivo 10 calls them "nodes" emerged from the data itself. In their research, Pope and Mays (2006:69) state that the researcher groups the data into themes, and examines all the cases in the study to make sure that all the manifestations of each theme have been accounted for and compared.

4.2.1 Presentation and discussion of results of the interview: analysis and interpretation

This study made use of thematic analysis of qualitative data, which specifically sought to answer the research questions from research objective one.

4.2.2 The provision of skills development to provide graduates employment

4.2.2.1 Perspective of industry participants

The participants were from a range of companies that represented different sectors and employment categories. The companies affiliated were also divergent from one another in terms of the quantity of employees, the annual turnover, and training budgets. Hence, the industry participants were rather diverse in their backgrounds and experience, enabling a more holistic commercial perspective of the areas of interest.

4.2.2.2 The strategic importance of skills development

Most of the participants indicated that skills development is an essential aspect of the companies they work within, with some of the participants indicating it as a fundamental focus of the company. In concurrence, respondent 4 pointed out their attitude toward the shortage of intermediate and high level skills in South Africa by stating:

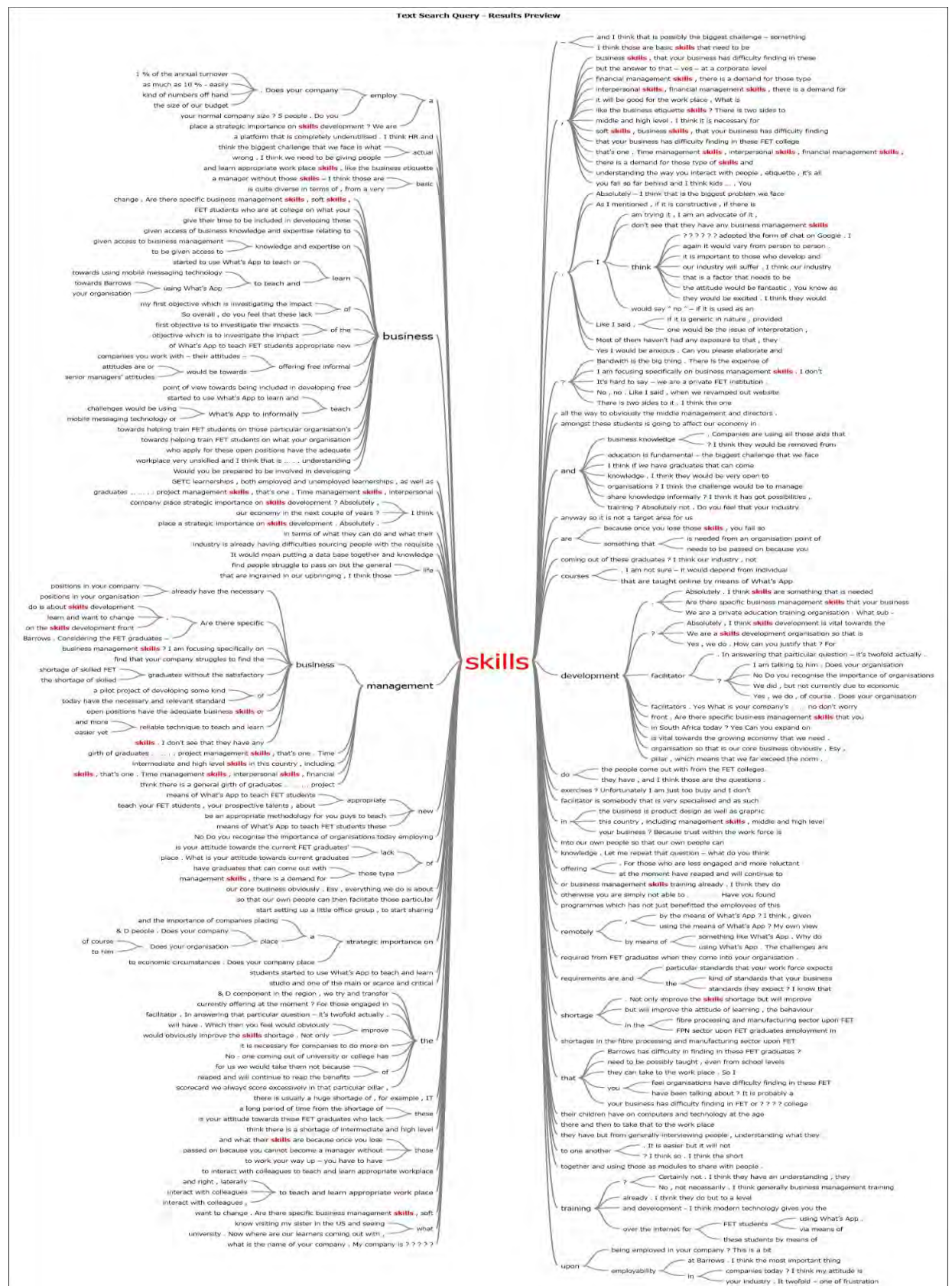
Respondent 4:

“Well I think there is a shortage of intermediate and high level skills in this country, including management skills, middle and high level.”

Respondent 4 went on further to discuss how organisations need to engage in greater skills development by stating:

“I think it is necessary for companies to do more on the skills development front.”

Figure 4.1 Skills word tree



4.2.2.3 Impact of skills shortage in industry

The general sense was that there were negative opinions and perceptions about the quality of the skills and abilities of FET College graduates, and a seemingly limited number of graduates with the competencies to cope with current ‘work environment’ demands. Respondent 4 reflected that there was a top-heavy amount of graduates but limited quality of graduates:

Respondent 4:

“There is excessive supply of graduates coming out of the institutions. [Pause] I think the quality issues are a concern. From my own experience we don’t get enough of high quality graduates. It’s always a few in a large bunch and I think that is where the intervention needs to be addressed.”

4.2.2.4 Impact of industry integrated experience

The sense was that the FET Colleges and training institutions are doing their best to train students appropriately, but without the practical work experience it is difficult to train students on the appropriate skills needed in the working environment. Respondent 4 was of the opinion that the FET Colleges had accomplished their task of preparing graduates for employability, nevertheless the students lacked work experience opportunities: Respondent 4 put it simply:

Respondent 4:

“I think that these FET Colleges have done all they can to prepare the students. [Pause] Unfortunately during the course of their training, there isn’t much opportunity for them to enter into the work place on a work experience, let’s say, module during their course”.

A recurring theme amongst the responses was that the students lacked demand driven skills required in the workplace, and these students employability was dependent on their potential to develop. Respondent 3 had the following to say:

Respondent 3:

“Generally people coming out of FET Colleges for us [pause] we would take them not because of the skills they have but from generally interviewing people, understanding what they are about and if they have an aptitude to solve problems, then we will train them ourselves within the company.”

4.2.2.5 Impact of supply and demand of quality graduates

There was an indication that certain open positions (such as sales) are difficult to fill. There are large amounts of graduates but many without the ability to be effective employees

Figure 4.2: Training word tree



Respondents 2, 3, 4 and 5 further suggested that the entire industry is likely to suffer from the lack of skilled graduates, which is a concern for their companies and the economy in general. Furthermore, the respondents endorse the notion that higher education institutes and private business must act more responsibly in providing graduate work integrated learning opportunities.

Respondent 2:

“I think there is a huge shortage of staff in those colleges with relevant experience. The perception is if they can’t do it they must go and teach. Unfortunately that is the impression I get. They either take students who have been through their system and because they have excelled and are a little better than the rest of their colleagues, they put them in as lecturers, again without industrial experience. Generally I think industries are very opposed to taking those little people in. As much as it is sad, I think it all has to do with inadequate staffing.”

Respondent 2:

...”if stuff is not relevant and if the lecturer is not relevant, he obviously is not going to share relevant experiences and therefore how are these youngsters ever going to know. It may just as well be book learning.”

Respondent 3:

“I think we need to be giving people actual skills that they can take to the work place.”

Respondent 4:

“Therefore I think it should become incumbent upon companies to understand the limitation and to give these graduates an opportunity and to make them work.”

Respondent 5:

“As such, getting graduates is simply not only the answer and maybe we need to start doing something much more than that in order to fill the gap that we currently see. The other thing is that I have a social responsibility as well.

You take these individuals and start to groom them for the type of environment you are in.”

4.2.3 Receptiveness towards using technology to develop skills in the workplace

4.2.3.1 The potency of MMT to teach and learn skills

When the participants were asked about using technology to teach and learn, many of them suggested it is becoming a part of our daily lives and should be embraced rather than avoided, as it has the ability to enhance human capital. Furthermore, technology is beginning to change and replace the demand for unskilled, routine jobs like clerks, telephone operators or factory line workers - that are governed by easily recognizable rules.

The World Economic Forum (2014) states it is important for developing countries to develop a healthy, educated and productive labour force by improving access to high quality school education.

Respondent 4 suggested that a mixture of face-to-face, experiential, and e-learning methodology is required in the workplace:

Respondent 4:

“I think there should be a blended learning approach where there is in the classroom, out in the work site, web enabled learning.”

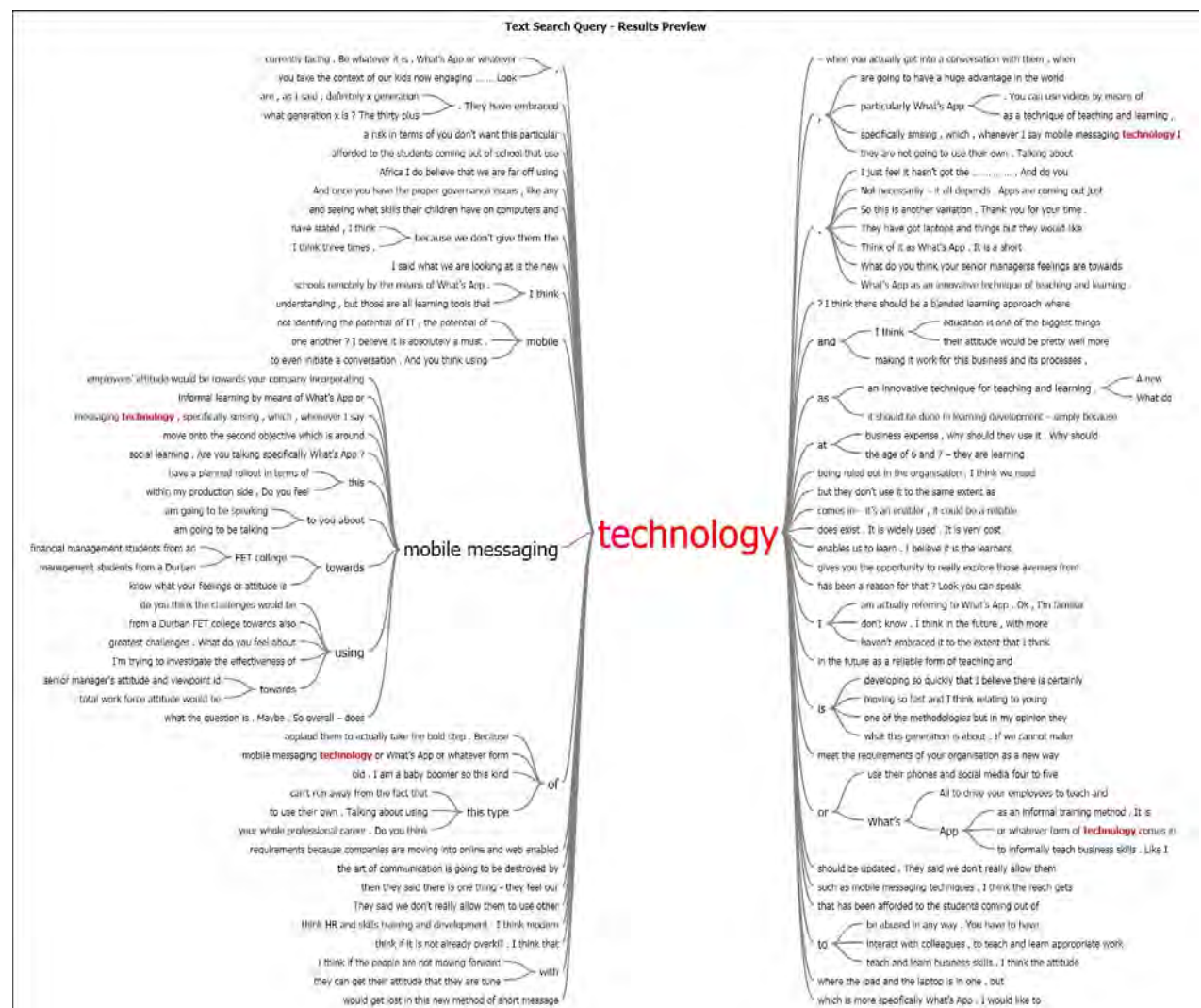
Respondent 3 indicated that there would be no issues communicating to management and salaried employees about implementing MMT to teach and learn new skills.

Respondent 3:

“If you communicating to our management structure and our salaried staff – I don’t think there would be a problem at all. I think they would adopt it and be happy to use it.”

There were discrepancies about whether the use of technology should be encouraged among students and graduates, with some suggesting it is underutilised whereas others denoted we should be cautious of it and the extent to which it is used to educate. Education stakeholders should consider the growing relevance and implications of technology – based education innovations that are opening up new opportunities and subsequently improving teaching and learning, particularly with the customization of learning to the needs of the individual learner (Groff, 2013). Some noted that e-learning is probably more beneficial than using mobile messaging to teach and learn, possibly due to the reduction of text associated with messaging.

Figure 4.3: Technology word tree



Respondent 2's statement reflects the rationale that student's face-to-face communication capabilities are deteriorating due to the excessive use of MMT, and therefore a decline in communication standards have ensued.

Respondent 2:

"They learn all the time – they are absolutely addicted. In fact I was reading the other day that it is almost starting to turn around where people are saying enough is enough. I was at a party for a sixteen year old on Saturday night and we said it was amazing – they put the music extremely loud, which of course my parents would have said turn that music down – so they couldn't communicate with each other and all of those youngsters were actually just sitting either WhatsApping each or looking at their cell phones. There was absolutely no communication so I find that disturbing. I think the art of communication has been lost and I am not convinced that it is the way to go. I think that the next generation is going to rebel somewhat against this. Definitely the standards of communication have dropped. They are unable to even initiate a conversation."

Interestingly, respondent 3 endorsed the notion that there would be a challenge with trust amongst weekly waged employees towards using MMT due to using texting. They had the following to say:

Respondent 3:

"The biggest challenge with, let's call it the work force, the weekly wage staff, would be as a trust issue. Because there is a serious mistrust between management and labour in this country and I think they could possibly perceive it as propaganda."

Respondent 5 further indicated that WhatsApp is not used worldwide and that it is not a universal tool to communicate, and therefore standards and guidelines for using MMT need to exist. Respondent 5 said:

Respondent 5:

“No.1 – not everybody is on WhatsApp and obviously all have their reasons why.”

Respondent 5:

“Like I said, one would be the issue of interpretation, to what degree, to what lengths do we go and put information on and what will be that interpretation to the person that is receiving the message. I think that would be one of the greatest challenges.”

4.2.3.2 The merits and de-merits of using MMT in the workplace

It seemed as though companies and employees would be amenable to introducing the technology in their working environment, but some noted it would be a challenge and difficult to manage during working hours. Others stated that it would contribute to fostering the sense of an organisational culture of learning and innovation. The quality use of modern technology in a learning environment like a classroom, or in the workplace is powerful, especially when it empowers students to develop scarce and critical cognitive, commercial and technical skills (Leadbeater and Wong, 2010).

Respondent 2 indicated the benefit of using WhatsApp as the method of disseminating important information and communicating business skills and knowledge in the workplace.

Respondent 3:

“It would be one of the methods of disseminating information. The more that I have come to understand the running’s of the business, understanding that you have to constantly be learning, and it’s a form of learning, so whatever you can do, it’s a form of learning. I don’t see the sharing of business knowledge as a problem. I think that is what has to happen. I think sharing of knowledge is vital to people to up skill themselves.” [Pause] I don’t think sharing that information would be a problem at all”.

Respondent 4 and 5 shared the notion that organisations are progressing towards web-related technologies, like MMT. Both respondents said that their senior workforce would be willing and prepared to engage with such technologies to teach business skills. One of the biggest challenges though will be whether education systems in developing countries like South Africa will be too slow in adopting the emerging trend of education technology and miss out on the benefits and advantages they offer as a strategic tool to learn (Learnnovators, 2014). However, an assessment of the pros and cons of using MMT to teach business skills is mandatory.

Respondent 4:

“...because companies are moving into online and web enabled technology. So this is another variation.”

Respondent 4:

“I think the managers I work with would be more than happy to ... it is not something they would withhold.”

Respondent 5:

“We must look at the merits and de-merits, we must look at the advantages and disadvantages of it.”

4.2.3.3 Risks and compliance of information sharing using MMT in the workplace

In terms of sharing information over the internet with students, most respondents noted it would be appropriate although there were concerns about security of information, and the type of information that is relayed should be more generic and non-sensitive. In their research Fox, et al. (2007) indicated that cross-cultural peer tutors can rearrange knowledge more effectively to enhance the students understanding of the instructional content by sharing their knowledge, ideas and experience as a means of overcoming some of the many challenges faced by students, specifically in townships and rural schools.

Respondent 2 and 3 indicated that using MMT would be possibly one of the most appropriate methods to increase and expand the facilitation of knowledge amongst one another in the workforce, however security remains a concern.

Respondent 2:

“I think it can be done [pause] our whole slogan is “share and double”. “Doubling through sharing”. That is our philosophy. But, I think that there is still a security issue.”

Respondent 3:

“I think that is probably the best way to share information.”

The respondents perceptions about the employees’ attitudes towards using the technology to teach and learn within the organisation seemed to indicate that they would be amenable to the idea, so long as it is used to educate, and it is something that would depend on each individual employee. In their research paper about learner motivation and engagement Lucas and Claxton (2010) found that the opportunity to contribute to concepts and design of learning enables learners to choose the methods that are relevant, and excite students.

Respondent 2 suggested that employees would avoid using their personal mobile phones and WhatsApp to collaborate and share information using MMT at their personal expense. Respondent 2 said:

Respondent 2:

“They probably feel because they don’t have cellphones that are issued by the business, throughout the business, only top management get them, that why should they use their airtime or whatever. I think there are a couple of challenges.”

The current challenges noted included poor IT infrastructure and limited access to internet and bandwidth.

Some noted that certain people who use MMT like WhatsApp may abuse of the tool (inappropriate use during working hours). There would need to be strict standards and guidelines about the use of MMT to teach and learn in the work place. The respondents indicated that rules and regulations need to be set out to achieve the purpose of learning. Respondent 1 and 2 indicated that modern organisation's need to remove and negate the current accessibility issues in the workplace, and moreover if people have access to MMT, like WhatsApp, to use it as a new teaching and learning method.

Respondent 1:

“My attitude about this is that we would be removing the issue of not having the access to learning. The more accessible we make it, the less excuses we will have.”

Subsequently, a policy upon the abuse of modern, digital tools in the workplace needs to be established from the onset. Respondent 2 had the following to say:

Respondent 2:

‘...just like we have to have firm policies and procedures for things like email usage - I think possibly there would be people abusing it, doing naughty things and all sorts of things like that on WhatsApp because they are all into their selfies and things and we can certainly attach that to WhatsApp. So, I think instead of it being an enabling thing, it could be a disabling thing in that you would have to have a lot of rules and regulations and punitive measures as well.’

Most of the respondents stated that their organisations would not avoid using it but that certain technologies may be more beneficial. It may be based on resistance to change and the effort levels required to introduce the change. Respondent 3 suggests that people who acquire the knowledge and ability to use technology have an advantage over other people who do not.

The respondent's attitude is that students do not constitute a problem towards using MMT in class to learn but rather the biggest obstacle or resistance would come from educators towards using MMT to teach and learn. South Africa needs to overcome the challenges it is facing in its classrooms with regard to its teachers who lack quality ICT skills to adopt new available technology into their curriculum in order to effectively promote the advancement of computer literacy, technology fluency and global networking amongst its students, in preparing them for their occupational field (Ndlovu and Lawrence, 2012).

Respondent 3:

“I think technology is moving so fast and I think relating to young children and young adults is the way they communicate – I think it is a platform they understand – I think if the people are not moving forward with technology and I think education is one of the biggest things we face – people who come from a background that are in tune with technology are going to have a huge advantage in the world over people who are not exposed to it. [Pause] I don't think the children will be the problem. Errr, I actually believe possibly the teachers will be your biggest obstacle because resistant to change is without a doubt one of the huge problems that we face, not only in any business.”

Respondent 5 suggests that technology is pervasive, and that it is an effective method to educate and access information in the workplace.

Respondent 5:

“Because of technology such as mobile messaging techniques, I think the reach gets a little bit further. I think it is wider and I think that they will be able to understand it and be able to respond at the time at their own convenience.”

4.2.3.4 Strategic importance of education technology in the workplace

When asked about short videos to teach and learn there were varied responses, including the current use of such media tools, the prospective cost reduction benefits of it, and the need to further explore the use of such tools. Duffy (2008) and recent research by Brinthaup, et al. (2011) states that the use of new Web 2.0 technologies like blogs, messaging boards, discussion forums, chats, wikis and You Tube have become increasingly popular as a means for students to learn from each other, and these digital tools are changing the nature and demand of learning, and moreover provide new support to learning.

Reacting to whether South Africa underutilizes technology to produce training and development materials, Respondent 2 and 3 agreed that it required a business mindset change to utilize such technologies in the workplace:

Respondent 2

“I think that in South Africa I do believe that we are far off using technology as it should be done in learning and development.”

Respondent 3:

“I think modern technology gives you the opportunity to really explore those avenues from a lot cheaper perspective. Before, if you wanted to put a staff training video together, it would probably cost you R60000, 00 to R100000, 00 – now you can do that and pass that information on at almost no cost whatsoever. [Pause] I think again it is changing businesses mindsets to embracing it because it does make a lot of sense. I think it is how business embraces it and actually turn that into a workable platform. Possibly for me it is the first time I have even thought about it. It makes a lot of sense, especially in terms of communicating with staff.”

4.2.3.5 Maintain quality and standard of education using MMT

The respondents' perception of whether the standards would drop if MMT like WhatsApp was introduced to teach and learn varied, with some suggesting it would not affect the standard whereas some indicated that it would. Groff (2013) states that many are finding the need to redesign curricula models that are less prescribed and driven more by learner needs using Web 2.0 technologies.

Respondent 1 and 3 shared the notion that results would need to be assessed and measured relative to the method of delivery. Furthermore, technology, specifically MMT should be used to supplement traditional learning nonetheless the areas of benefit would need to be determined. Educators and education policymakers should consider the growing relevance and implications of technology, and technology based education innovations, which are used on a mobile platform (OECD, 2010). The respondents had the following to say:

Respondent 1:

“We cannot look down on the results if the method was wrong. We must make sure that we are constantly assessing and re-evaluating and always conscious of the method and how that is being transferred.”

Respondent 3:

“If it is used as an add on – I think it could never replace [completely] traditional learning. But, it could certainly supplement it. If it is a supplement, there can only be benefit to it. I don't see it being a negative. I think it would be figuring out where the areas are that it would work best.”

The solution is to be conscious of the required learning standards, and to make certain that a plan and process is in place to ensure that the appropriate standards are maintained. Countries are going to have to diversify and redesign a whole new kind of education system, transforming its current public education system and its intersecting architecture into a new design consistent with the emerging economy (Prince, 2014).

Lowden, et al. (2011) noted how it is important to involve employers in the design and delivery of instructional courses in order to promote a broader range of cognitive and entrepreneurial skills and attributes that students are not being taught, and reflect them in a non-standardised curriculum.

Respondent 5 indicated that information is unlikely to be reduced to below required standards if the correct language, content and governance is provided from the onset.

Respondent 5:

“I really don’t think information is going to be reduced to sub-standard level. [Pause] I think we must get our message correct, we must get our language correct... Err, we must have proper governance structures in place.”

4.2.4 Summary of analysis and interpretation

The respondents were rather diverse in their industry backgrounds and experience, enabling a more holistic commercial perspective of the areas of interest. There is evidently a shortage of intermediate and high level skills in South Africa and graduates lack the necessary abilities to cope with working environment demands.

Skills development should be a fundamental focus of any company, and not just the country. Modern graduates lack work experience opportunities and the demand driven skills required in the workplace. Higher education institutes and private business must act more responsibly in providing graduates work integrated learning opportunities to drive social mobility amongst these graduates.

The respondents were amenable towards the use of technology as an informal but reliable technique to educate and train people on quality skills, and to share business knowledge amongst the workplace so that people can apply themselves more effectively. The effective use of technology as a tool to teach and learn in the workplace could enable an organisational culture of learning and innovation. However, using technology in education does come with its challenges and concerns about student’s face-to-face communication standards declining; security issues, poor IT infrastructure and access to Internet and bandwidth in rural and remote areas.

There would need to be strict standards and guidelines about the use of MMT to teach and learn in the workplace. Given the use of technology to teach and learn, not only policymakers but private business must be conscious of the required learning standards and make sure that a plan and process is in place to ensure the appropriate standards are maintained.

The challenge is that South Africa currently underutilizes technology in education and the way in which people regard using technology to teach and learn as an informal, supplementary tool to learn is perceived by people to have much lower standards. This may be based on resistance to change and the effort levels required to introduce the change.

4.3 Analysis of the questionnaire

In this part of the study, quantitative data was collected from a survey, which was completed by students and teachers from a public FET College in Durban. The researcher explored and investigated the quantitative data from the questionnaire that sought to answer the questions from research objective two, three and four. There were 19 items designed to measure various aspects of Acceptability of Mobile Messaging Technology as a Teaching and Learning platform.

These were broken down into six scales:

1. Attitude Toward Using Mobile Messaging Technology In Class (3 items)
2. Perceived Usefulness Of Mobile Messaging Technology As A New Way Of Teaching And Learning (3 items)
3. Perceived Ease Of Use Of Mobile Messaging Technology (3 items)
4. Intention To Use Mobile Messaging Technology (2 items)
5. Mobile Messaging Technology Self-Efficacy (3 items)
6. The Relevance Of Mobile Messaging Technology As A New Way Of Teaching And Learning (3 items)

The overall 19-item scale is henceforth referred to as the MMT T&L Acceptability Index. An aggregate score for each respondent was obtained by scoring each item from 0 = strongly disagree to 4 = strongly agree and adding up the individual item scores.

Missing values were handled by replacing them with the median response for that item. Question # 9 was reverse-scored since it was the only item where ‘strongly disagree’ represented a high degree of acceptability and ‘strongly agree’ a low degree of acceptability.

The Cronbach’s Alpha score for the index (as applied to students) was 0.478, which represents a relatively low degree of internal consistency. (However, this may be a reflection of the literacy level of the respondents rather than the scale itself).

The following is a histogram of the aggregate scores for students. It indicates that just over 30% of students scored in the top fifth of possible values, indicating an overall attitude of ‘strong agreement’ with MMT as a teaching and learning platform. About two-thirds (68%) of students scored in the next fifth of possible values, indicating an overall attitude of ‘agreement’ with MMT as a teaching and learning platform. Less than 2% were in the middle fifth, representing an overall neutral attitude. No respondents were in the bottom two-fifths; thus none of the respondents showed an overall disagreement with the idea of MMT as a teaching and learning platform.

Among teachers, all seven respondents fell into the ‘agree’ range overall.

The students and teachers of this particular FET College have thus made known their support for the idea of expanding the use of MMT as a teaching and learning platform.

Figure 4.4: Overall support for mobile messaging technology as a teaching and learning method among students

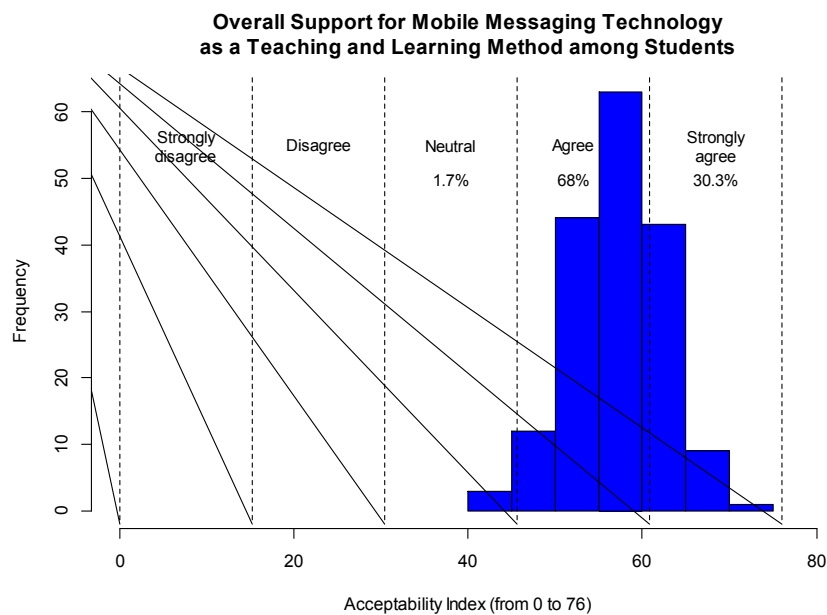


Figure 4.4 shows that over 30% of students indicated an overall attitude of ‘strong agreement’, and about 68% of students indicated an attitude of ‘agreement’ towards MMT as a teaching and learning method among students.

Figure 4.5: Overall support for mobile messaging technology as a teaching and learning method among teachers

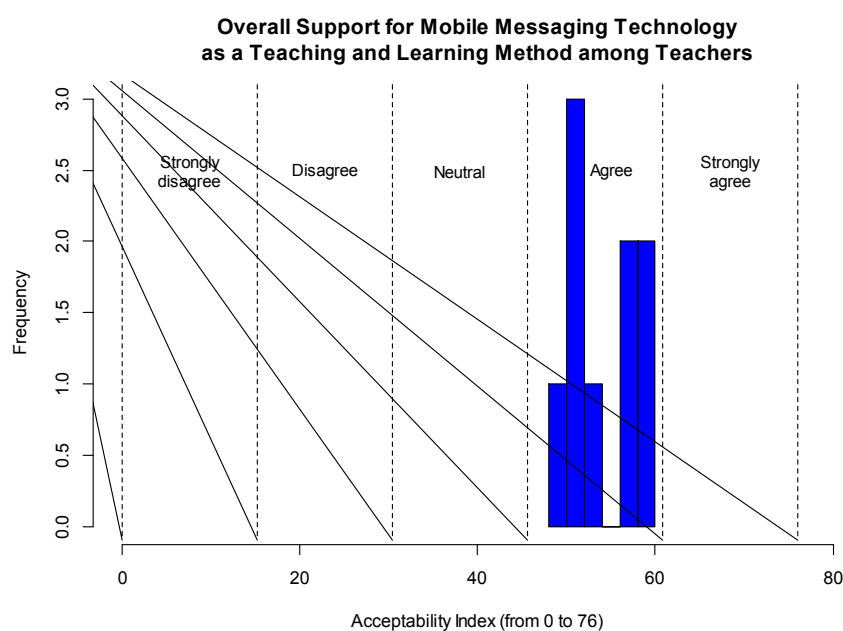


Figure 4.5 reveals that among teachers, all seven respondents fell into the 'agree' range overall.

Further statistical analysis was undertaken to see if the responses to individual items, or to the overall acceptability index score, varied according to demographic characteristics. This was done only for students, since the sample size for teachers was too small. Even among students, comparison was not possible across different income groups since there was not enough variation in the data, with nearly 95% of respondents indicating that they were in the lowest income bracket of R0 to R1500.

Analysis of mean MMT T&L Acceptability score according to age, dwelling type, preferred social media platform, and time spent on social media per day was undertaken using analysis of variance (ANOVA), but no statistically significant relationships were found. This suggests that students' interest in MMT for teaching and learning is the same across the different age groups, social media platforms, and even amount of time spent on social media.

Relationships between these demographic traits and responses to individual items were also investigated using the Pearson chi-squared test. Once again, no statistically significant relationships were found. This again suggests the students' attitudes toward MMT for teaching and learning is uniform. However, it should be borne in mind that the group of students surveyed seems to have been fairly homogeneous, with little variation in age or economic status.

It was more surprising to find that there was no difference in overall attitude to MMT between those students who use social media less than 30 minutes per day and those who use social media more than four hours per day.

4.3.1 Presentation and discussion of results of section A

Each question from section A will be broken down and analyzed with histograms. Section A covers the discussion of the quantitative analysis of the students and teachers simultaneously.

Figure 4.6: Illustration of the age group of the students

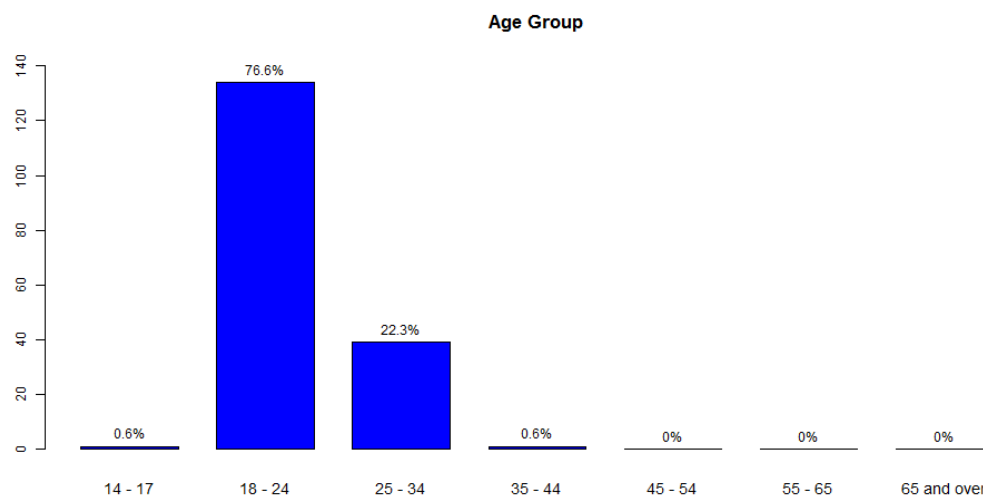


Figure 4.6 reveals that 76% of respondents ranged from the ages of 18 – 24 years old, and 22,3% of respondents ranged from the ages of 25 – 34 years old.

Figure 4.7: Illustration of the age group of the teachers

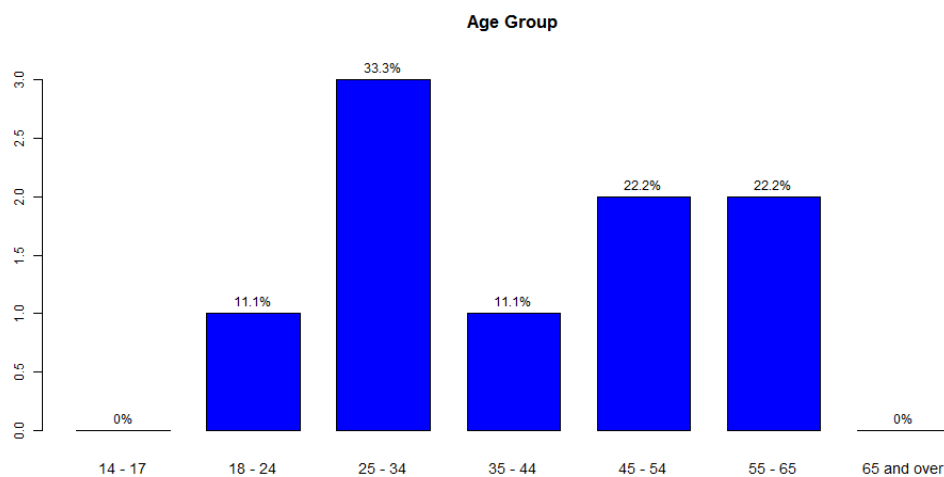


Figure 4.7 reveals that 11,1% of respondents ranged from 18 – 24 years old, 33,3% of respondents ranged from 25 – 34 years old, 11,1% of the respondents ranged from 35 – 44 years old, 22,2% of the respondents ranged from 45 – 54 years old, and 22,2% of the respondents ranged from 55 – 65 years old.

Figure 4.8: Illustration of Students Monthly Income

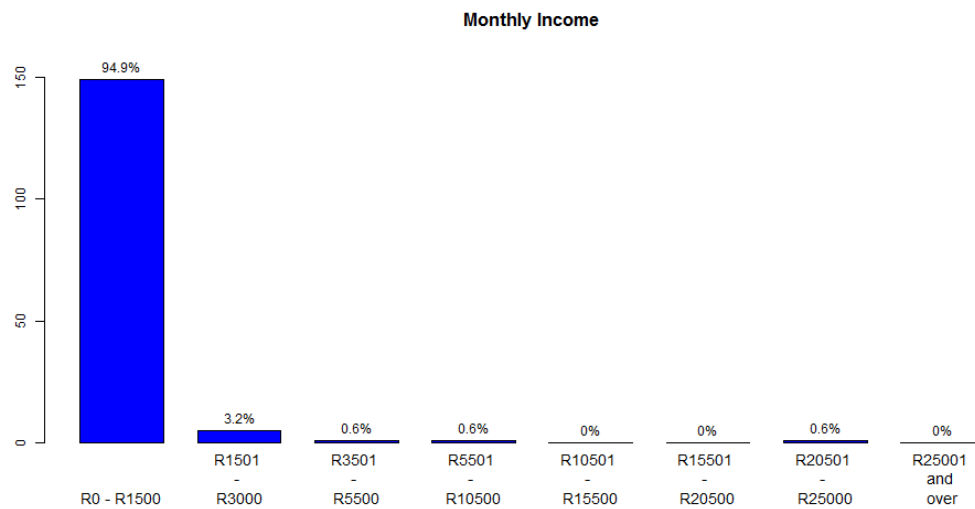


Figure 4.8: illustrates that 94,9% of the respondents earned a total monthly income ranging from R0.00 – R1, 500.00, and 3,2% of the respondents earned a total monthly income ranging from R1, 501.00 – R3, 000.00. 0,6% of the respondents earned a total monthly income ranging from R3, 001.00 – R5, 500.00. 0,6% of the respondents earned a total monthly income ranging from R5, 501.00– R10, 500.00. 0,6% of the respondents earned a total monthly income ranging from R20, 501.00– R20, 501.00.

Figure 4.9: Illustration of Teachers Monthly Income

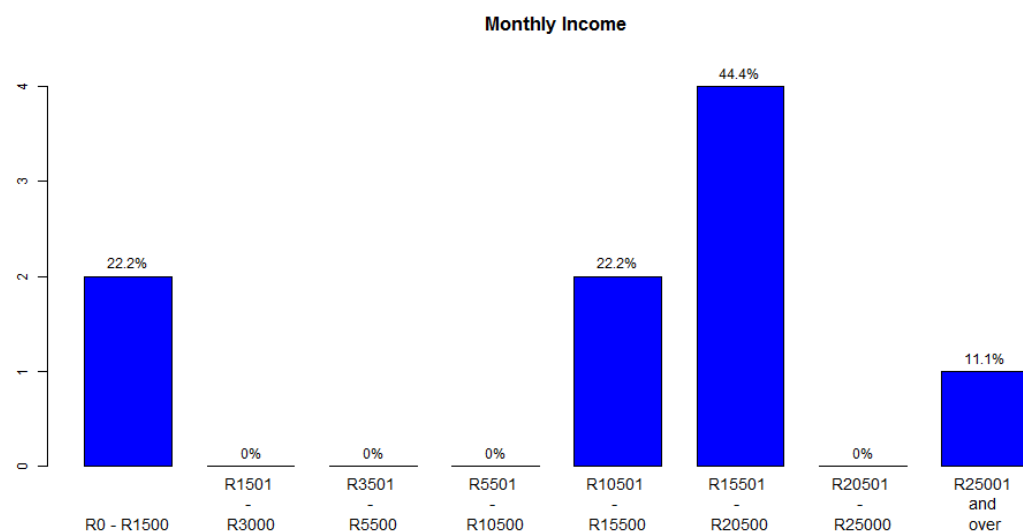


Figure 4.9 shows that 22,2% of the respondents earned a total monthly income ranging from R0.00 – R1, 500.00, and 22,2% of the respondents earned a total monthly income ranging from R10, 500.01 – R 15, 500.00, 44,4% % of the respondents earned a total monthly income ranging from R15, 501.00 – R20, 500.00, and 11,1% of the respondents earned a total monthly income ranging from R 25 001.00 and over.

Figure 4.10: Illustrates the Type of Dwelling Students Live in

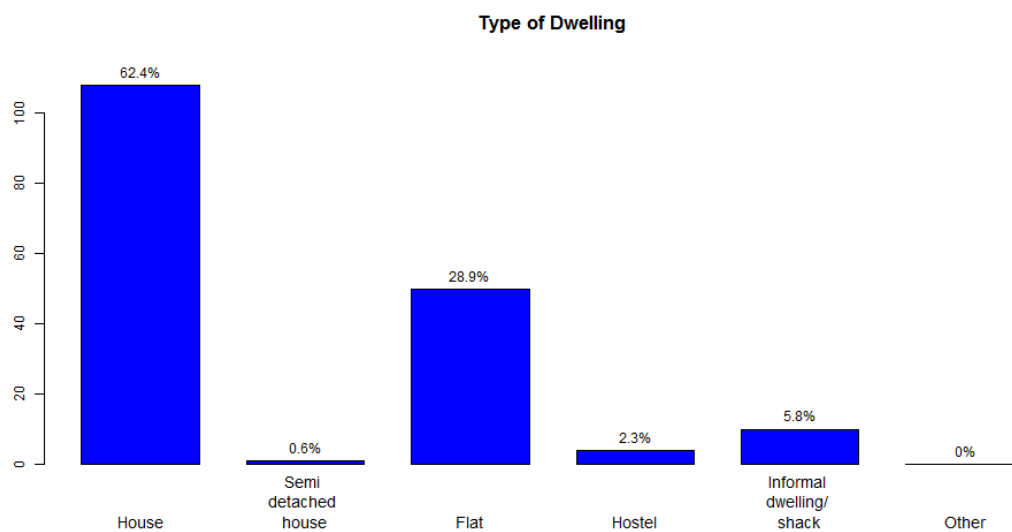


Figure 4.10 shows that 64% of the respondents live in a house, 0,6% live in a semi-detached house, 28,9% live in a flat, 2,3% live in a hostel, 5,8% live in informal / dwelling/shacks.

Figure 4.11: Illustrates the Type of Dwelling Teachers Live in

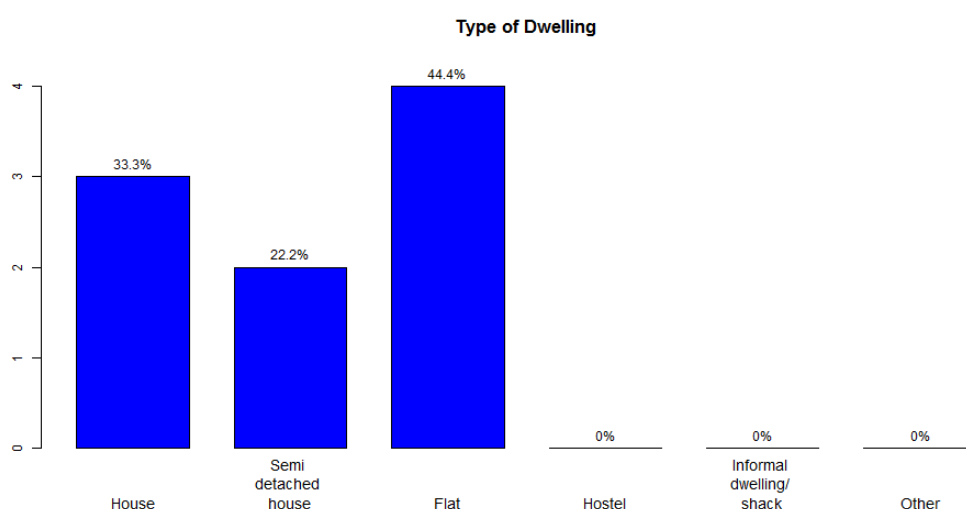


Figure 4.11 illustrates 33,3% of the respondents live in a house, 22,2% of the respondents live in a semi-detached house, 44,4% of the respondents live in a flat.

4.3.1.1 Analysis and interpretation of section A

In summary of viewing the age of the respondents, 76% of the students are between 18 – 24 years old. It signifies that some of these students are teenagers on the threshold of adulthood and that some of the students in this age group are ‘born frees’. 22,3% of the students are between the ages of 25 – 34 years old. 44,4% of the teachers are between 25 – 44 years old, and 44,4% of the teachers are 45 – 65 years old.

94,9% of the student population ranges from being unemployed to earning R1, 500.00 every month. It is to be expected that student’s currently studying do not earn a lot of money. 3, 2% of the student sample earned a total monthly income between R1, 501.00 – R3, 000.00. This implies that these students are most probably employed in part time jobs and working shifts to earn a living. This signifies that a very small portion of the student’s are currently contributing to the economy every month comparable to the 1,2% of students that earn an income between R 3,501.00 – R 10,500.00. 66.6% of the teacher’s earned between R 10,501.00 – R 20,500.00. Indicating that 44,4% % of the teacher’s earned a total monthly income ranging from R15, 501.00 – R20, 500.00.00 and 11,1% of the teacher’s earned a total monthly income ranging from R 25 001.00 and over, implying that these may be senior lecturers. The rest of the teachers earned between R0.00 – R 15, 500.00.

This shows that teachers in South Africa do not get paid well considering the poor conditions in which they are expected to do their job. This implies that the DoE needs to improve its compensation and remuneration policy framework for its teacher's.

Figure 4.10 shows that 64% of the student's live in a house, while 28,9% live in a flat and 2,3% live in a hostel. Although a large number of students live in formal structured housing, it is important to indicate that 5,8% of the student population live in informal settlements and may not have the money to live in a house, flat or hostel. Living in informal settlements implies that living conditions and standards of living are dangerous and dominated by daily challenges. 44,4% of the teachers live in a flat, and 33,3% live a house, and 22% live in a semi-detached house, signifying that a house and flat seem to be the common types of dwelling for both respondents.

4.3.2 Presentation and analysis of section B

In Section B, a five-point likert-style rating scale was used, in most questions, to the extent to which the respondents (students and teachers) agreed or disagreed with the items in the questionnaire.

An analysis of these questions will answer the second, third and fourth research objective, which determines the respondent's attitudes, and effectiveness towards using MMT as a strategic teaching and learning tool.

The scale is illustrated below:

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1	2	3	4	5

4.3.2.1 Determining respondent's social media experience

Questions 5 to 6 from Section B of the questionnaire evaluate the respondents most preferred social media experience.

Figure 4.12: Illustrates the students number 1 social media platform

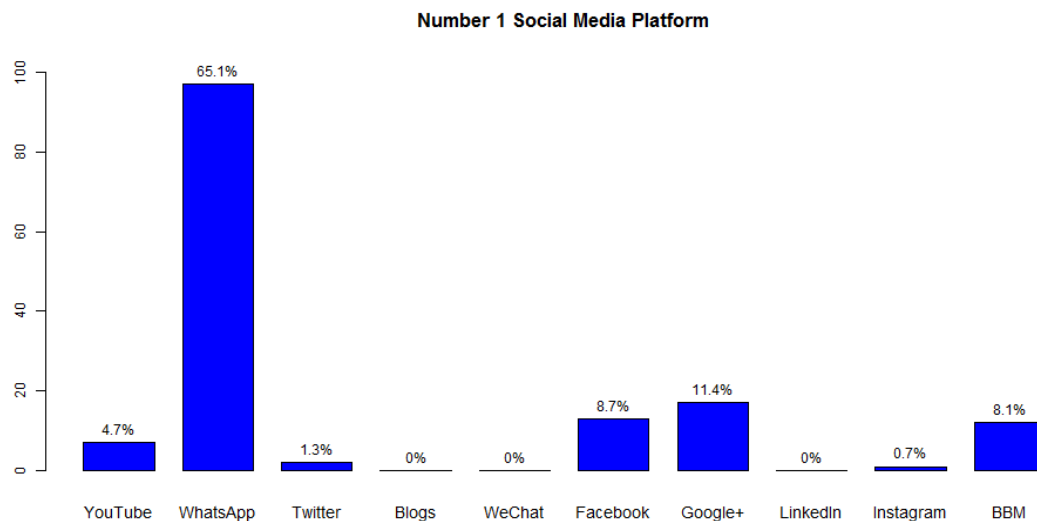


Figure 4.12 reveals that the 65,1% of the student's that were surveyed ranked WhatsApp as their number 1 social media platform. Recent research on the most globally popular smartphone messaging system (WhatsApp Blog, 2014) has shown WhatsApp as one of the most popular paid-for apps on any platform, with over 500 million users worldwide.

Figure 4.11 illustrates that the student's surveyed indicated that they ranked Google+ higher than Facebook. 11,4% indicated that Google+ was their number 1 choice, and 8,7% of the students said that Facebook was their number 1 choice.

The balance of the students selected BlackBerry Messenger (BBM) (8,1%), YouTube (4,7%) and Instagram (0,7%) as their first choice.

Figure 4.13: Illustrates the teachers number 1 social media platform

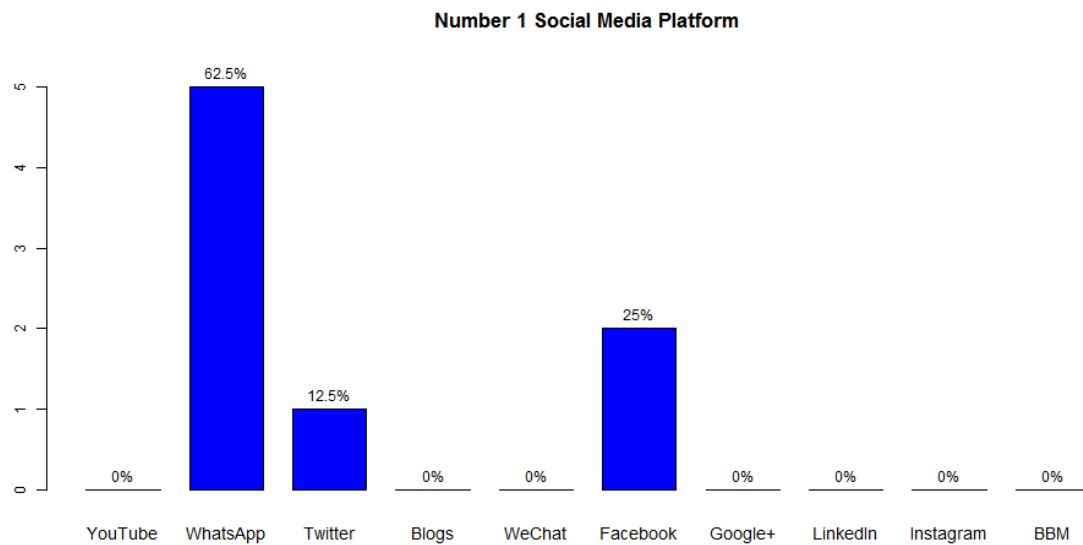


Figure 4.13 illustrates that 62,5% of the teacher's surveyed indicated WhatsApp as their number 1 social media platform. 25% of the teacher's ranked Facebook as their number 1 social media platform, and 12,5% ranked Twitter as their number 1 social media platform. WhatsApp is the most popular social media platform amongst both, students and teachers. This could be a sign that they are receptive towards using information communication technology.

Figure 4.14: Illustrates the students number 2 social media platform

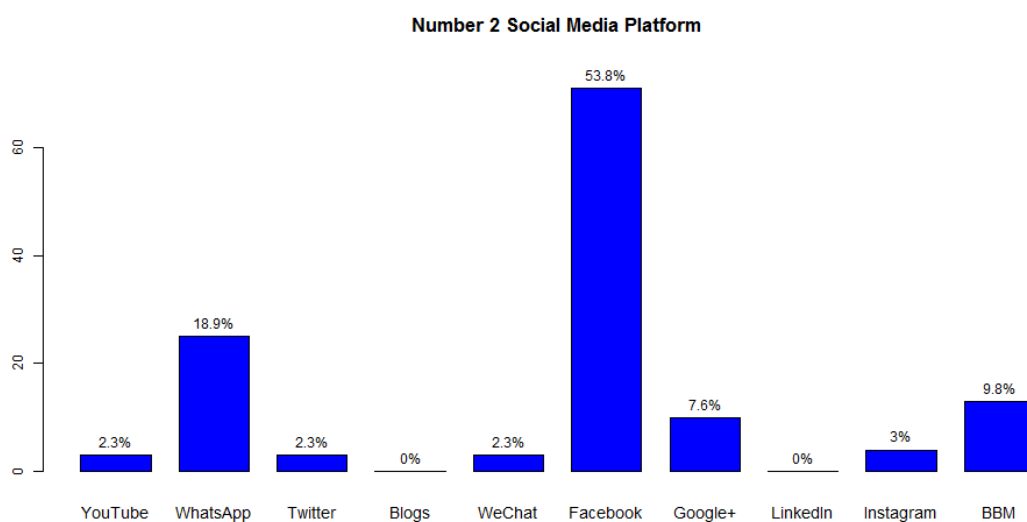


Figure 4.14 shows 53,8% of the students surveyed selected Facebook as their number 2 social media platform. 18,9% of the students surveyed have shown that WhatsApp is their number 2 choice in social media platform.

The balance is split amongst BBM (9,8%), Google+ (7,6%), Instagram (3%), and Twitter, WeChat, YouTube (2,3%) as the respondent's number 2 choice in social media platform.

Figure 4.15: Illustrates the teachers number 2 social media platform

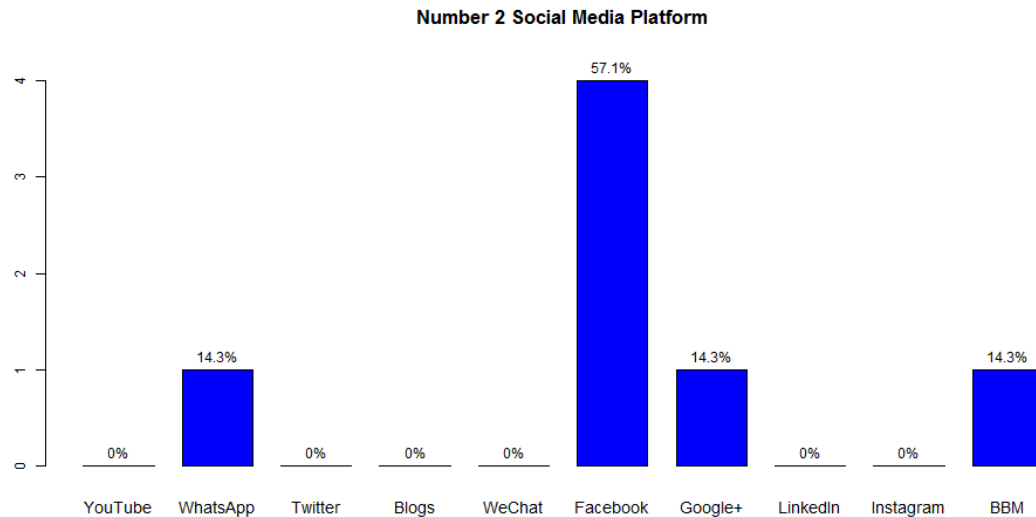


Figure 4.15 shows 57,1% of the teacher's surveyed selected Facebook as their number 2 social media platform, and 14,3% of the teachers selected either; WhatsApp, Google+ and BBM. This signifies that Facebook is the number 2 social media platform for both, students and teachers in this research.

Figure 4.16: Illustrates the students number 3 social media platform

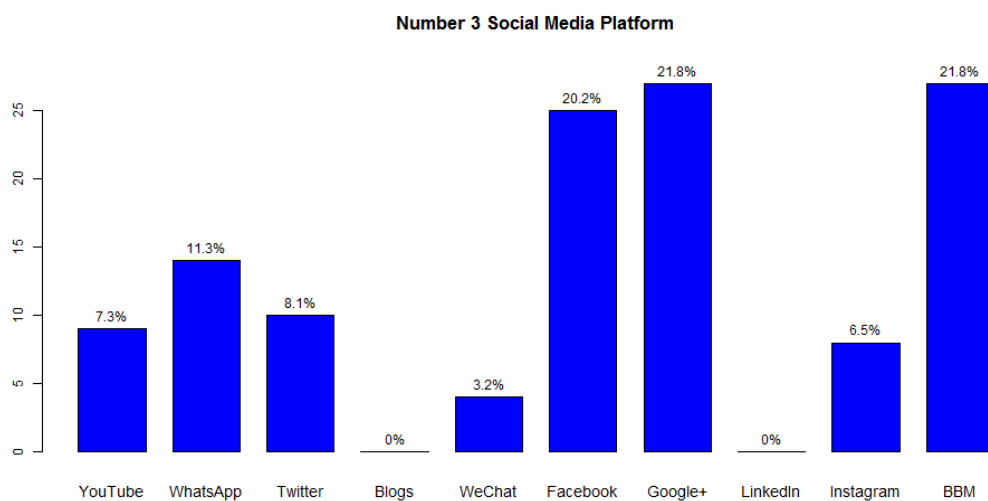


Figure 4.16 reveals that 21,8% of the student's surveyed chose either Google+ or BBM as their number 3 social media platform.

20, 2% of the student's selected Facebook, and 11, 3% indicated that WhatsApp was their number 3 social media platform. Figure 1.12 shows that 25,1% of the student's surveyed nominated Twitter (8,1%), YouTube (7,3%), Instagram (6,5%) and WeChat (3,2%) as their number 3 social media preference.

Figure 4.17: Illustrates the teachers number 3 social media platform

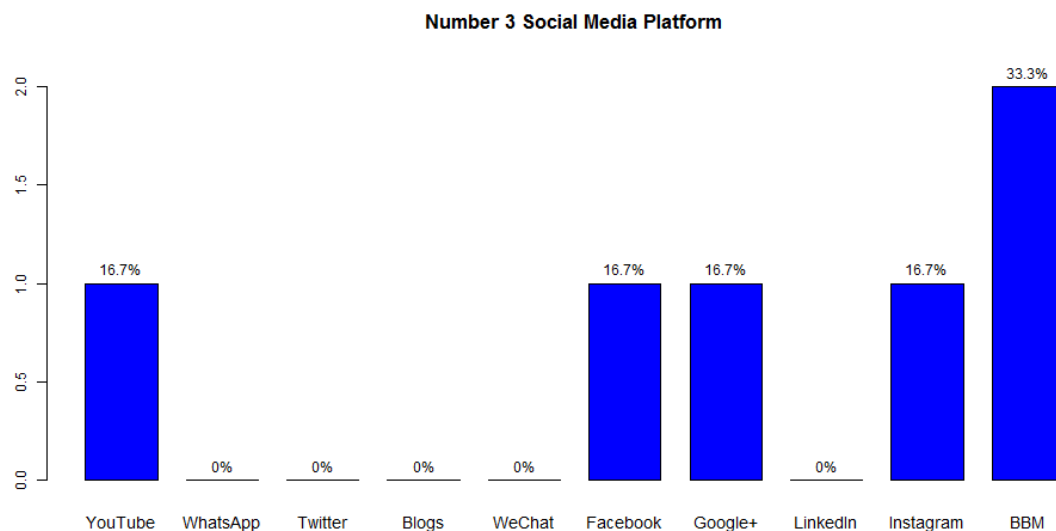


Figure 4.17 illustrates that 33, 3% of the teacher's surveyed selected BMM comparable to the 21,8% of students who chose BBM as their number 3 social media platform. BBM, which was once upon a time a major player in the mobile messaging market, is now under pressure to deliver better functions and options against players like WhatsApp.

Figure 4.16 and Figure 4.17 imply that BBM holds little gravitas as a preferred social media platform. Figure 4.17 reveals that the balance of the teacher's surveyed chose; YouTube (16, 7%), Facebook (16, 7%), Google+ (16, 7%) or Instagram (16, 7%) as their 3rd most preferred social media platform.

Figure 4.18: Illustration of how much time students spend on social media every day

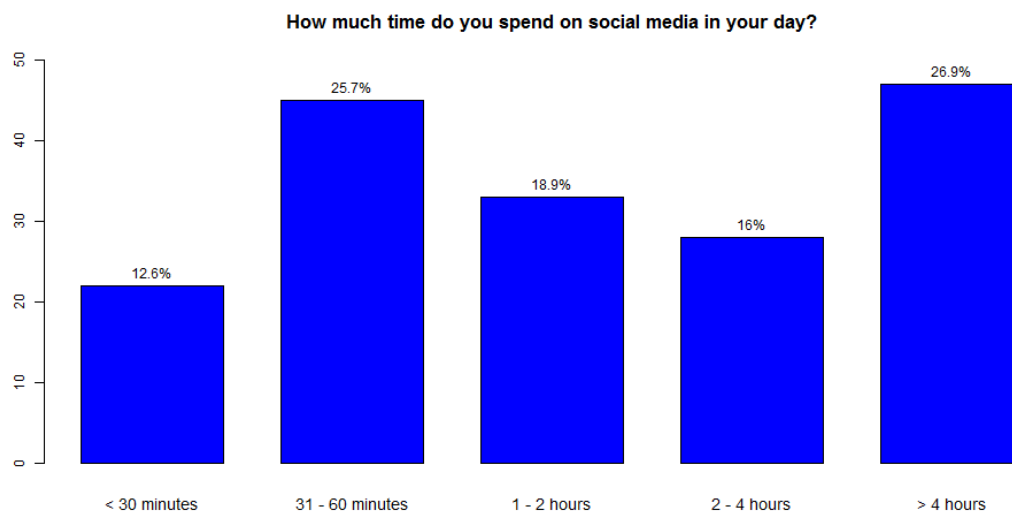


Figure 4.18 shows that 12, 6% of the student's surveyed spend less than 30 minutes on social media, while 25,7% of the student's investigated spend between 31-60 minutes per day on social media. Figure 4.18 implies that 34, 9% of the student's surveyed spend between 1 – 4 hours per day on social media. Specifically, 18,9% of the student's spend between 1 - 2 hours on social media per day, while 16% of the student's spend between 2 – 4 hours on social media per day. 26, 9% of the student's surveyed spend more than 4 hours on social media per day, which signifies that the respondents spend a considerable portion of their day engaged and interacting with social media.

Figure 4.19: Illustration of how much time teachers spend on social media every day

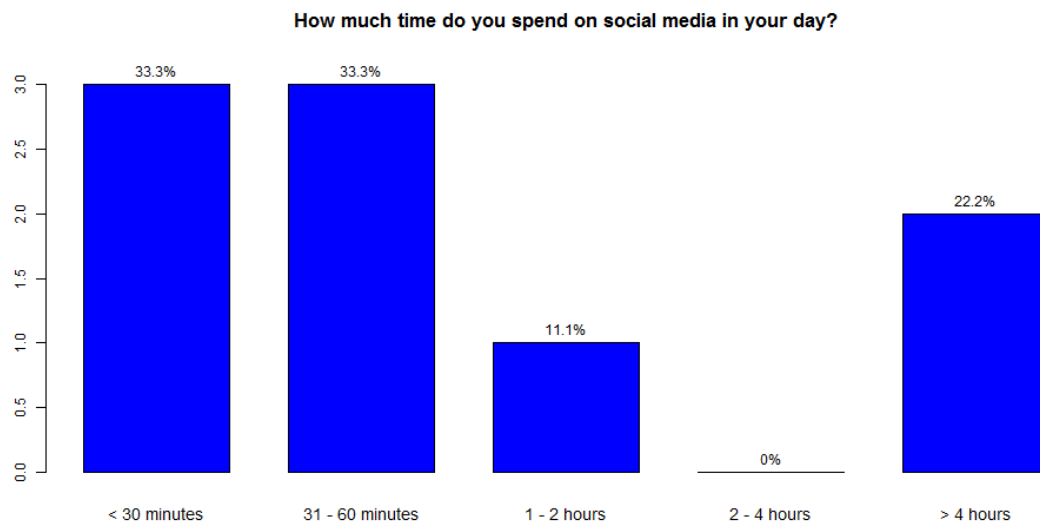


Figure 4.19 shows 77,7% of the teacher's spent from less than 30 minutes up to 2 hours on social media per day. Specifically, 33,3% of the respondents spend less than 30 minutes, and 33,3% of the respondents spend approximately 31 – 60 minutes on social media per day. Figure 4.18 reveals that 11,1% of the respondents spend 1 – 2 hours, however 22,2% of the respondents spend more than 4 hours on social media per day.

In comparison to the student's surveyed in Figure 1.15, teachers spend considerably less time on social media per day than students.

4.3.2.2 Determining respondent's attitude toward using mobile messaging technology in class

Questions 7 to 11 from Section B of the questionnaire evaluate the respondents thinking and feeling towards using MMT in the classroom.

Figure 4.20: Illustration of student's attitude towards peer-to-peer teaching when a teacher is not available

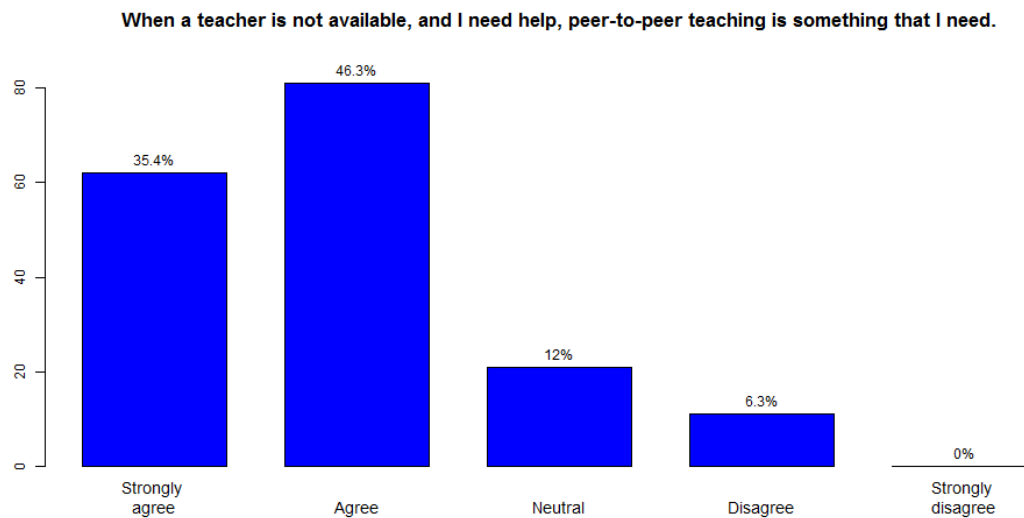


Figure 4.20 illustrates that 81,7% of the students agreed that peer-to-peer teaching is something they need when a teacher is not available. 12% of the respondents are neutral, and 6,3% of the respondents disagreed. Although peer-to-peer teaching may be discretionary it is an opportunity that can be explored to assist student's to meet the national standards, and improve their barriers to learning.

Figure 4.21: Illustration of teacher's attitude towards peer-to-peer teaching when a teacher is not available

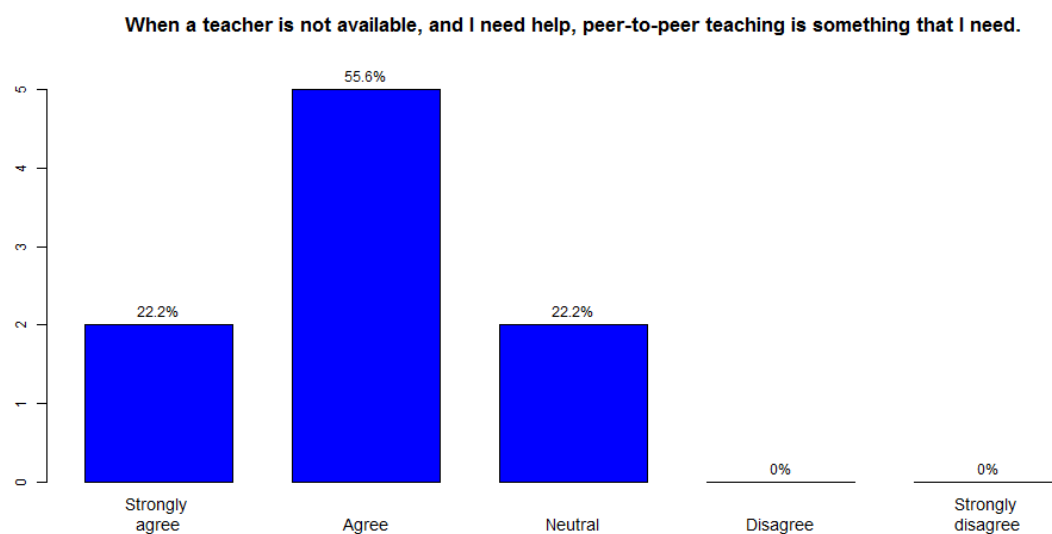


Figure 4.21 reveals that 77,8% of the teachers surveyed agreed that peer-to-peer teaching is something they need when they are not available. 22, 2% of the teacher's indicated that they are neutral towards peer-to-peer teaching. The use of peer-to-peer teaching can aid mixed ability grouping of students who are slightly ahead of the other students that require assistance, with those who demonstrate proficiency in a particular topic or subject to teach other students who are struggling. Peer-to-peer teaching benefits more time for individualised learning, allowing for a much better understanding of the material.

Figure 4.22: Illustration of the online tools students use to communicate with their peers

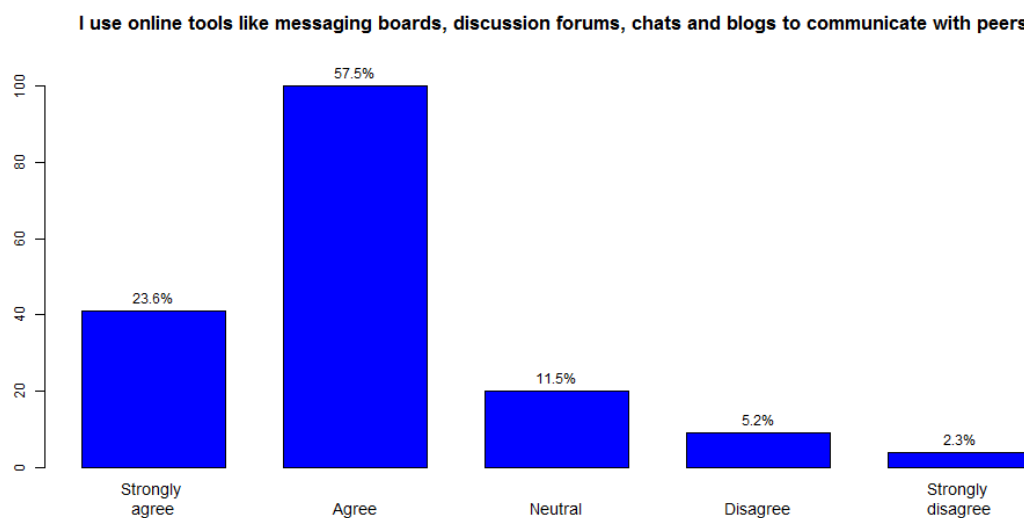


Figure 4.22 illustrates that 81, 1% of the student's surveyed agreed that they use online tools to communicate with their peers. 7, 5% of the student's disagreed that they use online tools to communicate with their peers. 11, 5% of the student's responded 'neutral'. This signifies that the students interest in technology to communicate and network is very high amongst the students. The use of online communication tools is an opportunity that needs to be exploited.

Duffy (2008: 122) noted that the potential benefits identified by learning specialist Fernette and Brock Eide and cited by Will Richardson (2006) in *Blogs, Wikis, Podcasts, and other Powerful Webtools for Classrooms* include the following:

- Can promote critical and analytical thinking

- Can promote creative, intuitive and associational thinking
- Can promote analogical thinking
- Potential for increased access and exposure to quality information
- Combination of solitary and social interaction

Figure 4.23: Illustration of the online tools teachers use to communicate with their peers

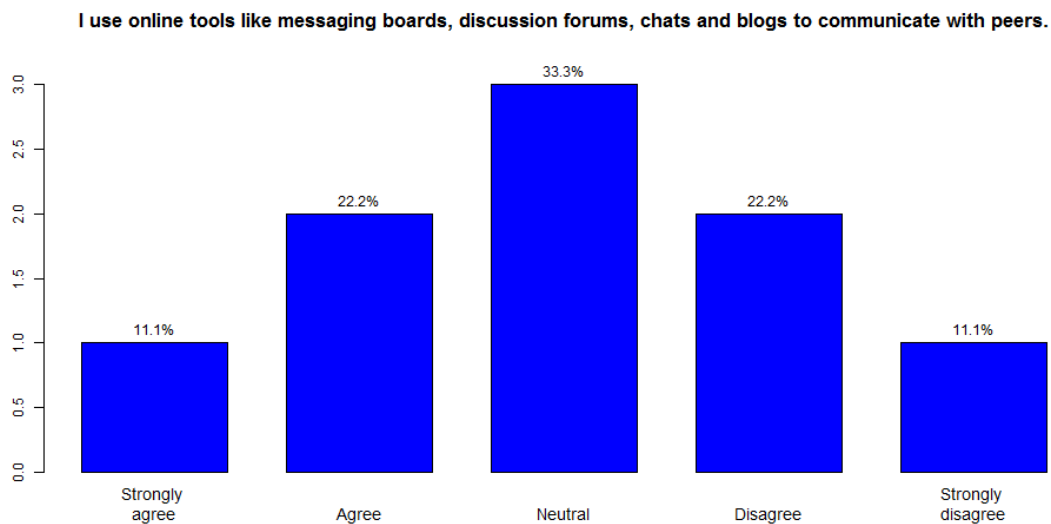


Figure 4.23 reveals 33, 3% of the teacher's surveyed agreed that they use online tools to communicate with peers. In comparison to Figure 4.22 it is obviously less than the proportion of the students who agreed to use online tools to communicate with their peers. 33, 3% of the teachers were neutral, and 33, 3% of the teacher's disagreed that they use online tools to communicate with their peers.

Figure 4.23 infers that the utilization of online tools to support teaching and learning is not encouraged as a strategic importance in our public colleges. Ndlovu and Lawrence (2012: 4) note that teachers probably do not have the appropriate knowledge to stimulate the advancement of learner thinking process through integration of online tools into their teaching.

Figure 4.24: Illustration of student’s attitude towards their standards dropping if they began using their mobiles to learn and teach

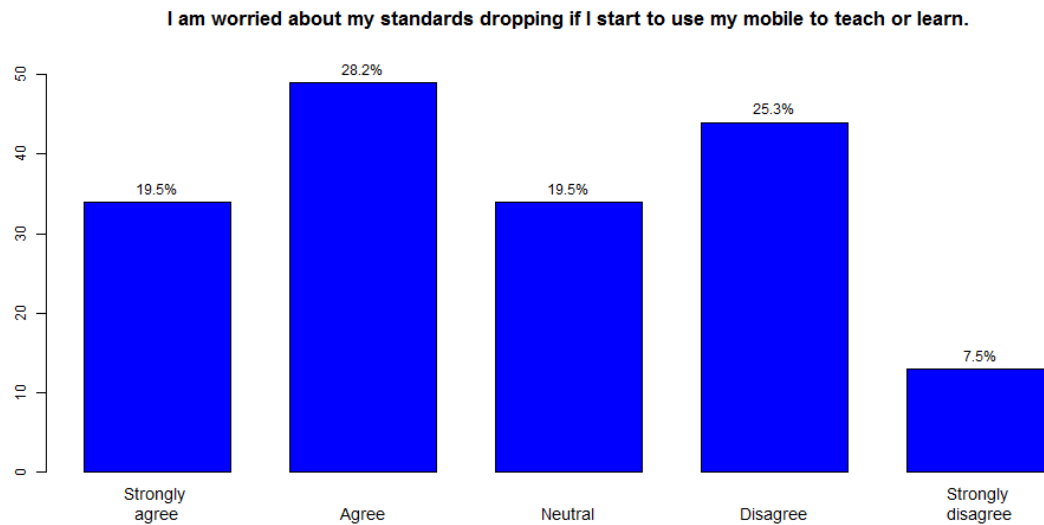


Figure 4.24 illustrates 47,4% of the student’s surveyed agreed that they were worried about their standards dropping if they used their mobile phones to teach or learn. 19,5% of the students indicated that they were neutral, and 32,8% disagreed that they were worried about using their mobiles to teach and learn.

Duffy (2008: 119) noted that students today have grown up within a world of pervasive technology including mobile phones, digital cameras and the omnipresent Internet. Prensky’s research in 2004 (cited Duffy, 2008: 119) describes how students operate at, “twitch speed” expecting instant responses, feedback and on demand access using their mobile phones every day.

Mobile phones are social based technologies that can enable social commentary to existing instructional content, collaborative assessment and related subject matter sharing. Mobile phones are placing control of the learning experience in the students hands.

Figure 4.25: Illustration of teacher's attitude towards their standards dropping if they began using their mobiles to learn and teach

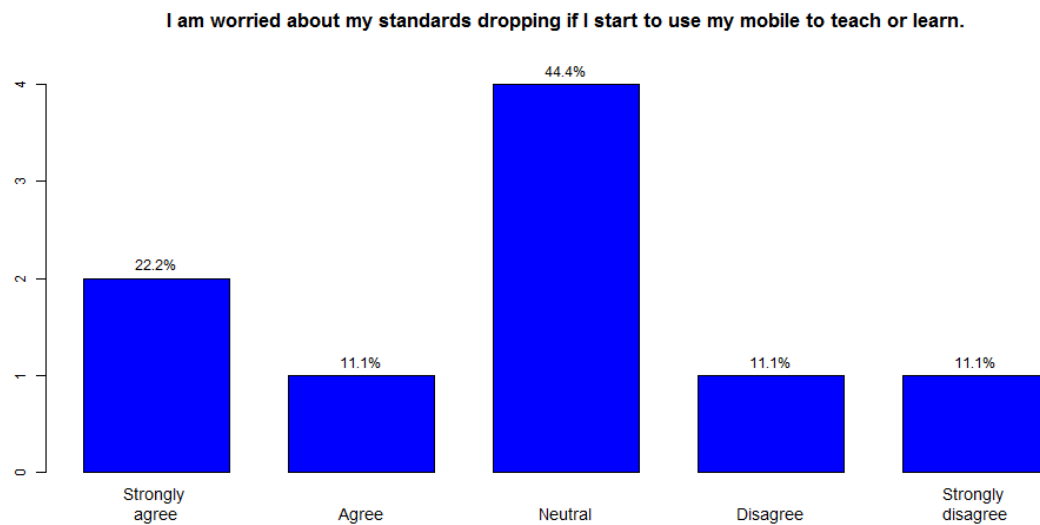


Figure 4.25 shows 33, 3% of the teacher's surveyed agreed they were worried about their standards dropping if they used their mobile phone to teach and learn. 44, 4% of the teacher's were neutral, and 22, 2% disagreed that they were worried about using their mobiles to teach and learn. Figure 4.25 shows the sensitivity of teachers using mobiles to teach and learn. Teachers are bound to recognise using their mobile phones to teach and learn as experimental, and not a traditional, formal way to teach and learn.

Figure 4.26: Illustration of the student's attitude towards being included in developing teaching material

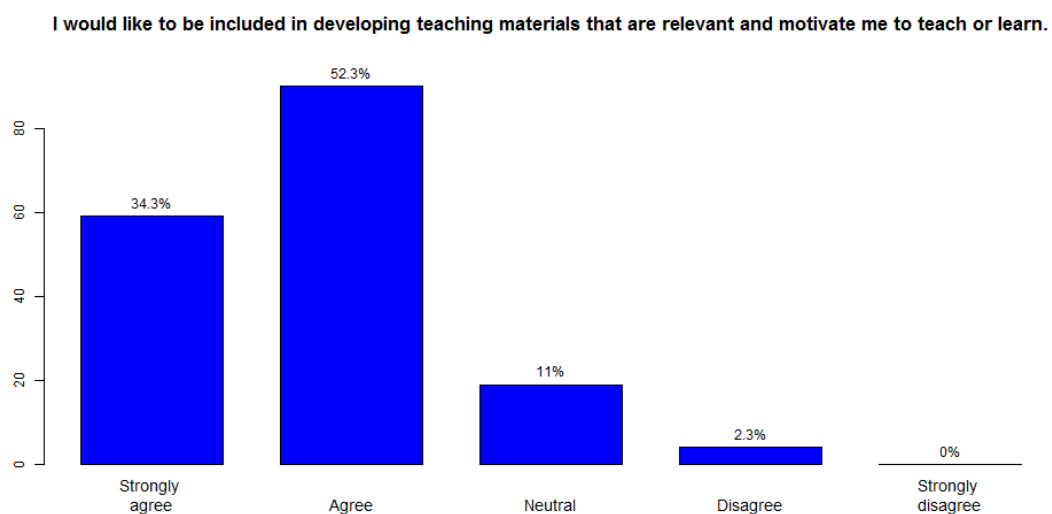


Figure 4.26 reveals that 86, 6% of the students surveyed indicated that they would like to be included in developing teaching materials that are relevant and motivate them to learn. 11% of the respondents were neutral, and 2, 3% disagreed. Globalisation and new patterns of working and living are increasing the demand for specialist skills and knowledge. But to be ‘knowledgeable’ will not be good enough. In recent research Cisco System (2010) suggest that more students than ever before need to have advanced capabilities for critical thinking, collaboration, and problem solving to be able to engage with real-world problems.

Barber et al. (2013: 25) noted that a degree has currency in the labour market and while, as we have seen its value is falling, it is nevertheless a passport to a range of professional opportunities denied to those without one. Are South Africa’s education leaders doing enough to use new technologies to increase possibilities to provide strong foundations of future knowledge, and enable the creation of communities of connected learners of all ages without regard for location?

Figure 4.27: Illustration of the teacher’s attitude towards being included in developing teaching material

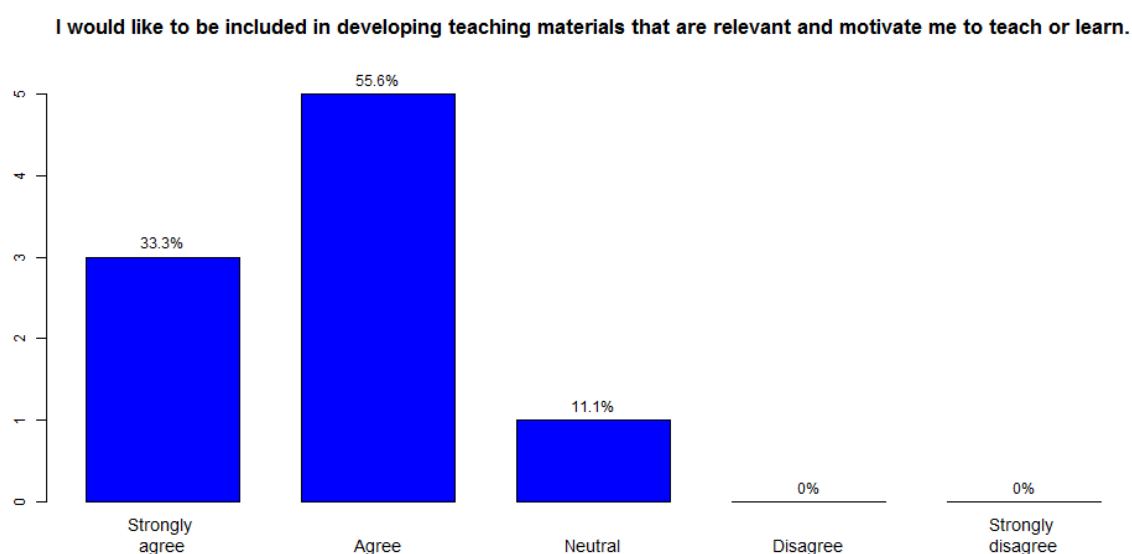


Figure 4.27 illustrates that 33, 3% of the respondents strongly agree, 55, 6% of the respondents agree, and 11, 1% of the respondents are neutral towards being included in developing teaching materials. The South African education system requires a new scientific way of thinking.

Learning is fundamental to the progress of South Africa, and the mass education system in South Africa requires a bold transformation to help ensure a sustainable economy. Barber et al. (2012: 34) notes that a major tendency of academe in the past 50 years has been increasing specialization and therefore increasing expertise in ever-narrowing fields, but the breakthroughs may well come when people connect across boundaries or when an individual or team synthesizes knowledge and trends from many fields.

Figure 4.28: Illustration of the attitude towards students using mobile videos to teach and learn new skills and knowledge

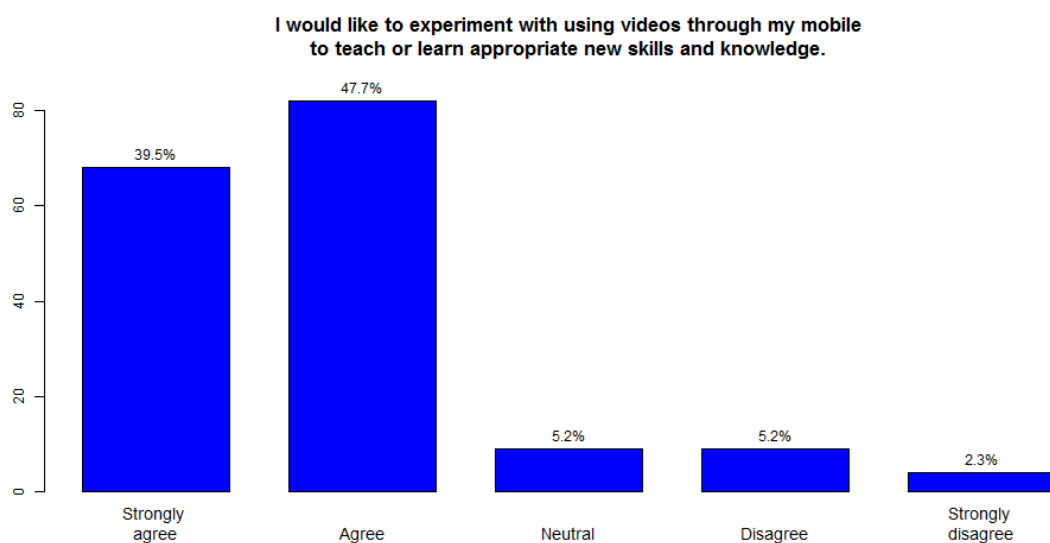


Figure 4.28 shows that 87, 2% of the students surveyed agreed to using mobile videos to teach and learn new skills and knowledge. 5, 2% of the respondents were neutral, and 7, 5% disagreed to using mobile videos to teach and learn new skills and knowledge. The World Economic Forum (2014: 69) notes that digital literacy is necessary to build a knowledge economy.

Training in basic computer skills enables students to find and understand information communicated through technology. It also empowers individuals with the vital skills to solve problems in a scalable, sustainable way.

Duffy (2008: 125) highlights some specific examples of approaches to incorporating YouTube into the teaching and learning experience (adapted from Educase Learning Initiative, 2006):

- YouTube can be used to create a learning community where everyone has a voice, anyone can contribute, and the value lies equally within the creation of the content and the networks of learners that form around content discovered and shared.
- Allow your students to create a short video as part of an assessment item instead of the traditional essay. Becoming involved in the creation of a video “heightens a student’s visual literacy, an important skill in today’s electronic culture”.

Figure 4.29: Illustration of the attitude towards teachers using mobile videos to teach and learn new skills and knowledge

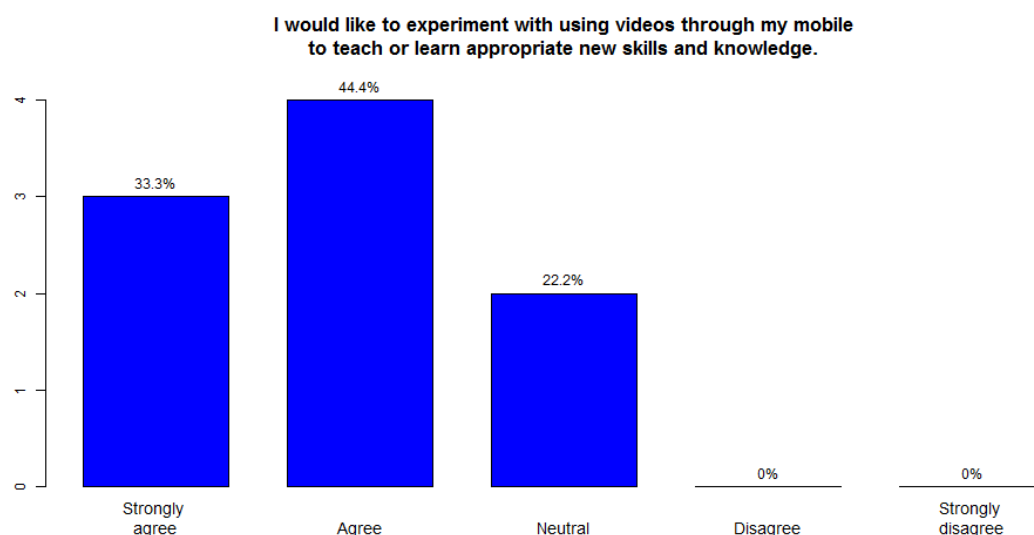


Figure 4.29 shows 77, 7% of the teachers surveyed agreed toward using mobile videos to teach and learn new skills and knowledge, and 22, 2% of the respondents were neutral. Duffy (2008:124) noted that educators are increasingly using YouTube as a pedagogic resource for everything from newsworthy events from around the world to ‘slice-of-life’ videos used to teach students within an ESL (English as a Second Language). Figure 1.26 indicates that the teachers surveyed are receptive towards using mobile videos like YouTube to teach and learn new skills and knowledge.

4.3.2.3 Determining perceived usefulness of mobile messaging technology as a new way of teaching and learning

Questions 12 to 14 from Section B of the questionnaire evaluate the respondent's perceived usefulness of MMT as a new way of teaching and learning.

Figure 4.30: Illustration of how mobile messaging technology enables the student to complete a task / assignment more quickly

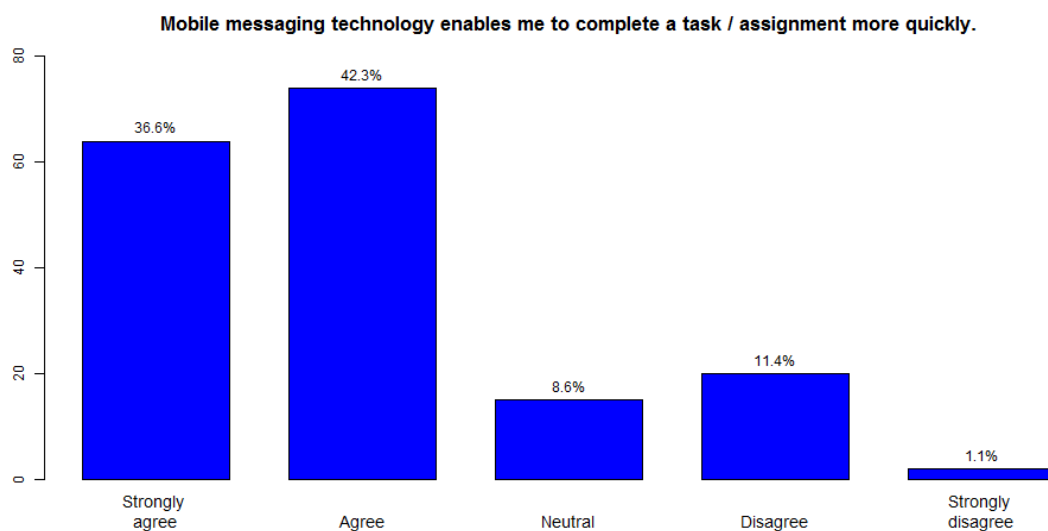


Figure 4.30 reveals 78, 9% of the students surveyed agreed that MMT enables them to complete a task / assignment more quickly, while 12, 5% disagreed. 8, 6% of the teachers surveyed were neutral. Wang (2014:1) states that mobile learning is developing since the access to devices (mobile phones) are already in people's pockets. How to use multimedia-learning resources to enable students to complete their tasks, and improve their results of learning has to be seriously considered by all specialists in the educational field.

Figure 4.31: Illustration of how mobile messaging technology enables the teacher to complete a task / assignment more quickly

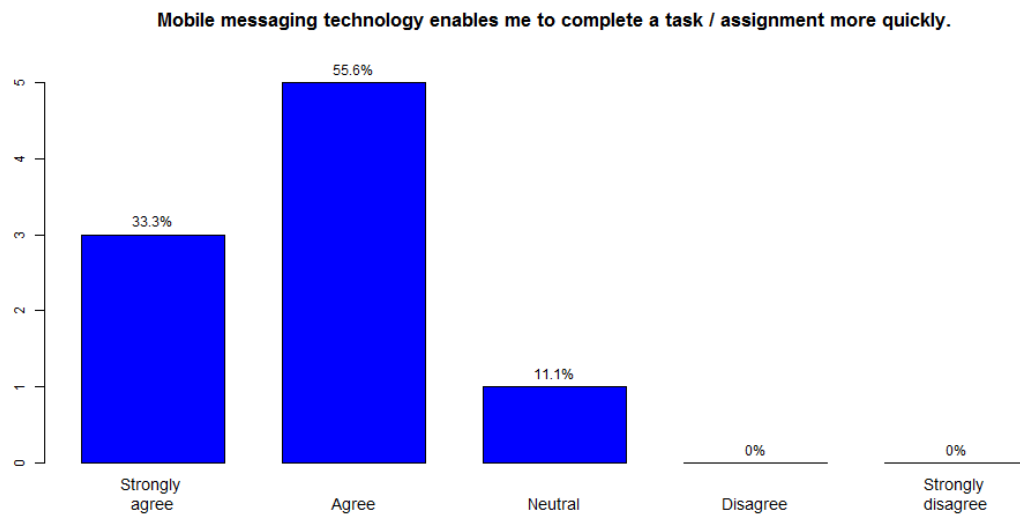


Figure 4.31 reveals 88, 9% of the teachers surveyed agreed that MMT enables them to complete a task / assignment more quickly, while 11, 1% of the teachers surveyed were neutral. Wang (2014: 2) notes that teachers use WeChat public accounts to send information to their students and allow them much more freedom to perform their desired tasks.

Figure 4.32: Illustration of how mobile messaging technology increases the student's productivity in the academic setting

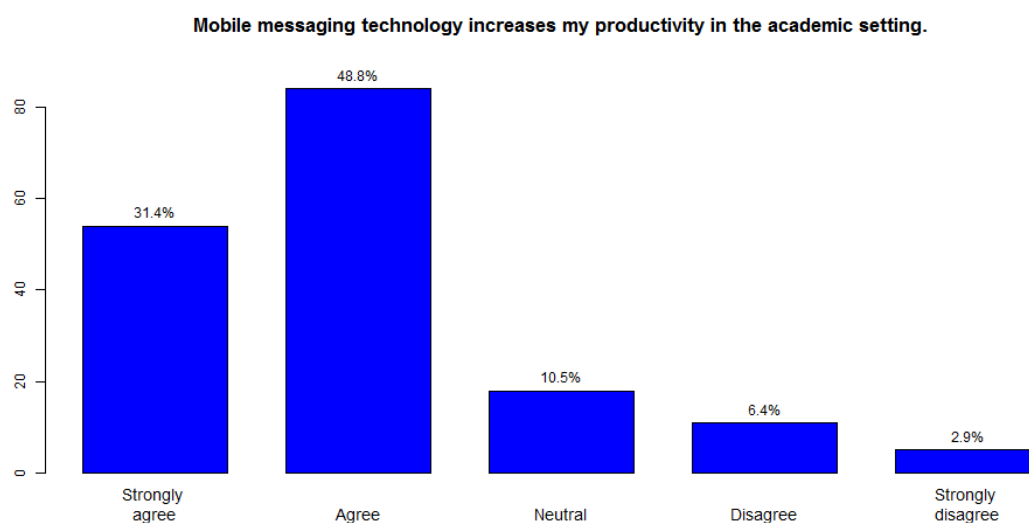


Figure 4.32 shows that 80, 2% of students surveyed indicated that MMT increased their productivity in the academic setting, whereas 9, 3% disagreed. 10, 5% of the students surveyed indicated that they were neutral.

Wang Zhuli research in 2011 (cited in Wang, 2014) states that learners can record their ideas on mobiles, notebooks or in blogs, at any time, and discuss them with their colleagues and friends and then achieve a complete and excellent article after enough material is collected and organised. This strategy is very practical and operable.

Figure 4.33: Illustration of how mobile messaging technology increases the teacher's productivity in the academic setting

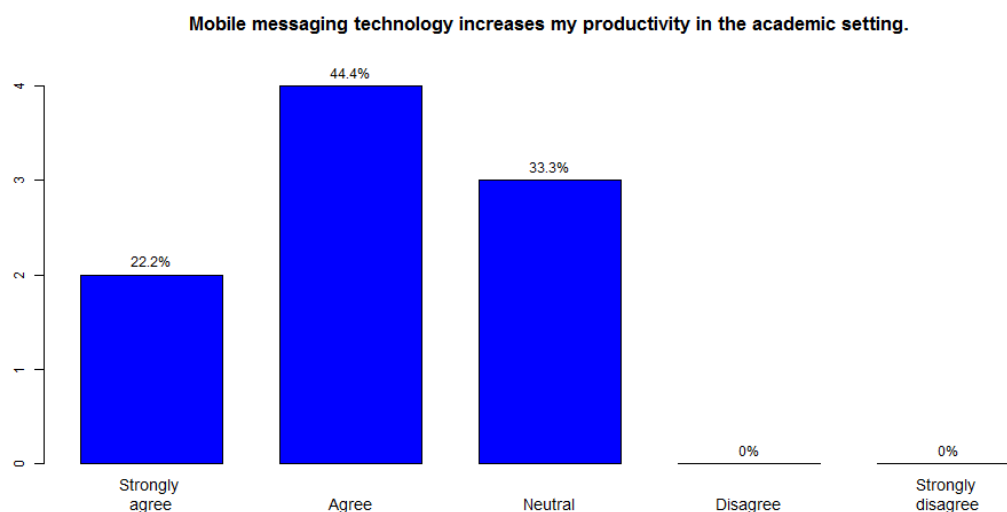


Figure 4.33 reveals 22, 2% of the respondents strongly agree, 44, 4% of the respondents agree, and 33, 3% of the respondents are neutral about MMT increasing their productivity in the academic setting. Wang (2014: 12) notes that the WeChat environment has more advantages than the traditional forum. It includes various resources, provides group learning, and implements online activities as part of a learning framework.

Figure 4.34: Illustration of how mobile messaging technology makes it easier for student to do their work

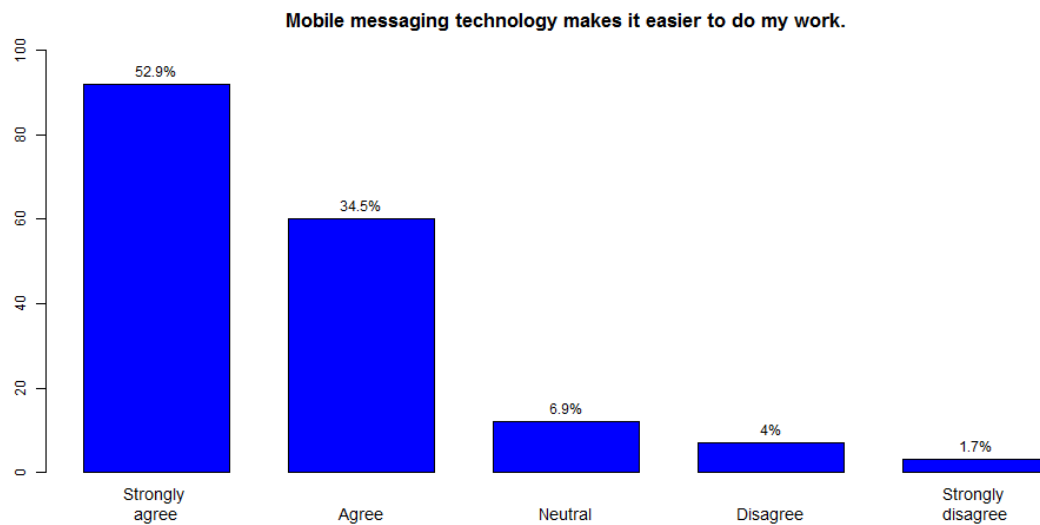


Figure 4.34 reveals 87, 4% of the students surveyed agreed MMT makes it easier to do their work, 5, 7% disagreed, and 6, 9% were neutral. Students need to adjust themselves to new teaching and learning methods like independent learning, in order to get the most out of mobile teaching, and to ensure effective learning.

Figure 4.35: Illustration of how mobile messaging technology makes it easier for teachers to do their work

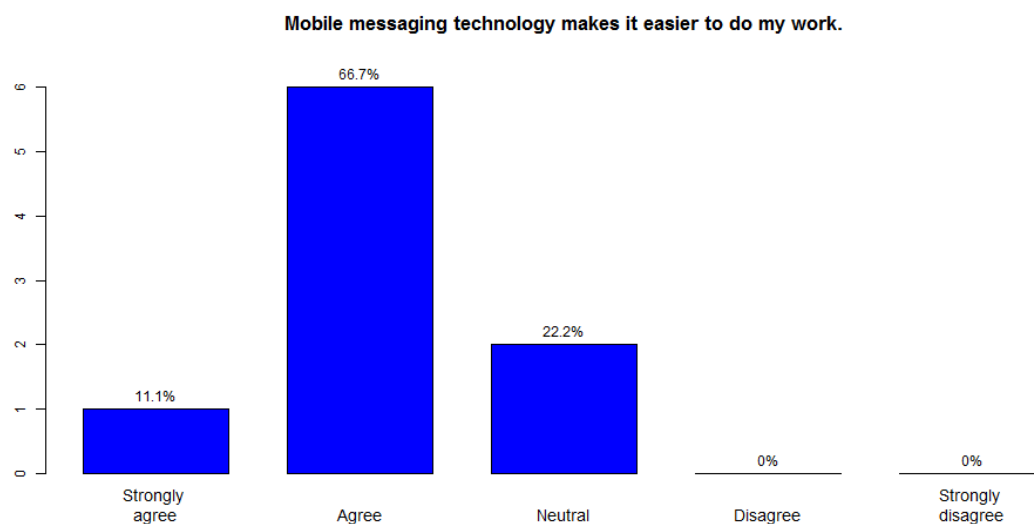


Figure 4.35 illustrates 77, 8% of the teachers surveyed agreed that MMT makes it easier to do their work, and 22, 2% were neutral. However, teachers need to learn to be more tolerant of less active students for their mistakes and lack of engagement, or poor performance towards learning independently via mobile phones.

4.3.2.4 Determining perceived ease of use of mobile messaging technology

Questions 15 to 17 from Section B of the questionnaire evaluate the respondent's perceived ease of use of MMT.

Figure 4.36: Illustration of how easy it is to learn to operate mobile messaging technology for the students

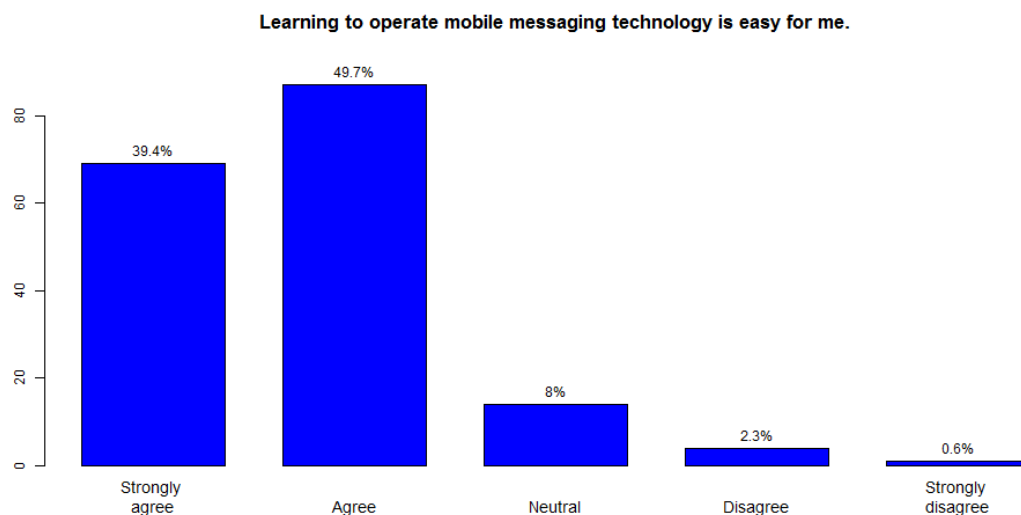


Figure 4.36 illustrates that 89, 1% of the students surveyed agreed that learning to operate MMT technology is easy for them. 2, 9% disagreed and 8% were neutral. The World Economic Forum (2014: 64) states, today, digital innovation is driving unprecedented change across the education sector. In doing so, it has the potential both, to improve learning outcomes and expand access to high quality education opportunities in ways that would have been unimaginable even a decade ago. These digital innovations will transform both what happens in the classroom as well as broader educational policy in the years to come.

Figure 4.37: Illustration of how easy it is to learn to operate mobile messaging technology for the teachers

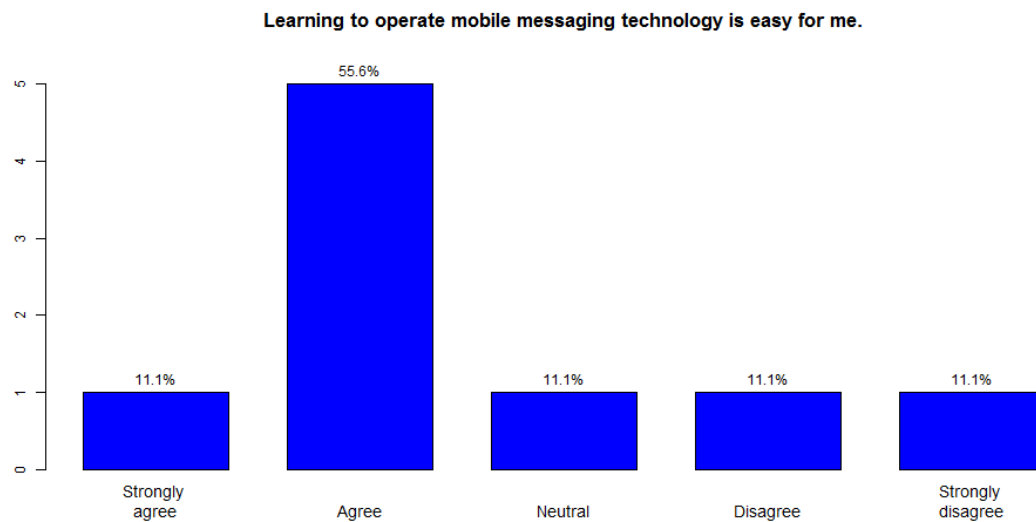


Figure 4.37 shows that 66, 7% of the teachers surveyed agreed that learning to operate MMT technology is easy for them. 22, 2% disagreed, and 11, 1% of the teachers were neutral. Wang (2014: 13) states that teachers feel insecure, because of the fear that mobile networks will threaten their roles as teachers.

Figure 4.38: Illustration of how easy it is for the students to become skillful using mobile messaging technology

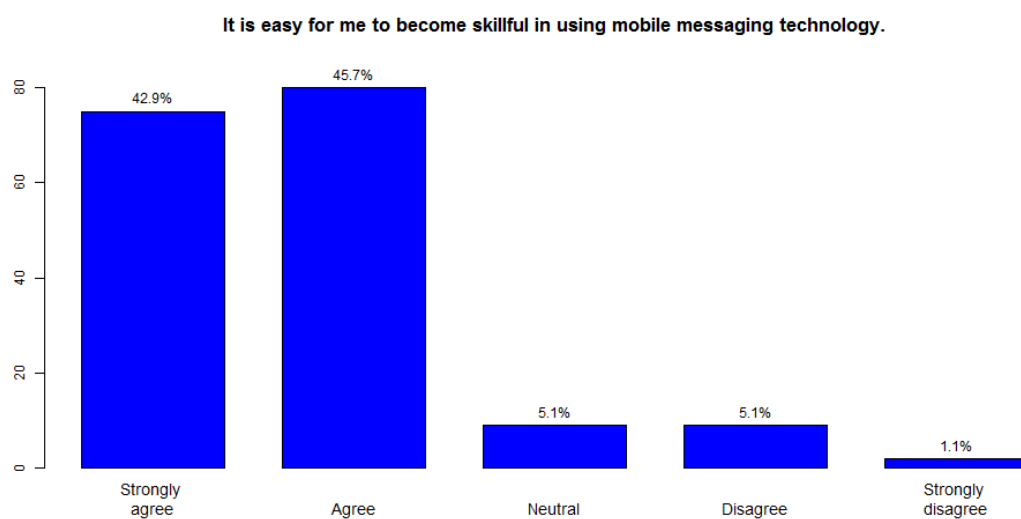


Figure 4.38 reveals that 88, 6% of the students surveyed indicated how easy it is for them to become skillful using MMT. 6, 2% disagreed, and 5, 1% indicated that they were neutral. Duffy (2008: 120) states from a student perspective we must reflect on the changing nature of our students as key stakeholders in the educational process. Millennial's approach their work, recreation and education in new ways. They prefer random "on-demand" access to media expecting to be in constant communication with their friends. The dominance and pervasive use of technology is placing the control of the learning experience itself in the hands of the student.

Figure 4.39: Illustration of how easy it is for the teachers to become skillful using mobile messaging technology

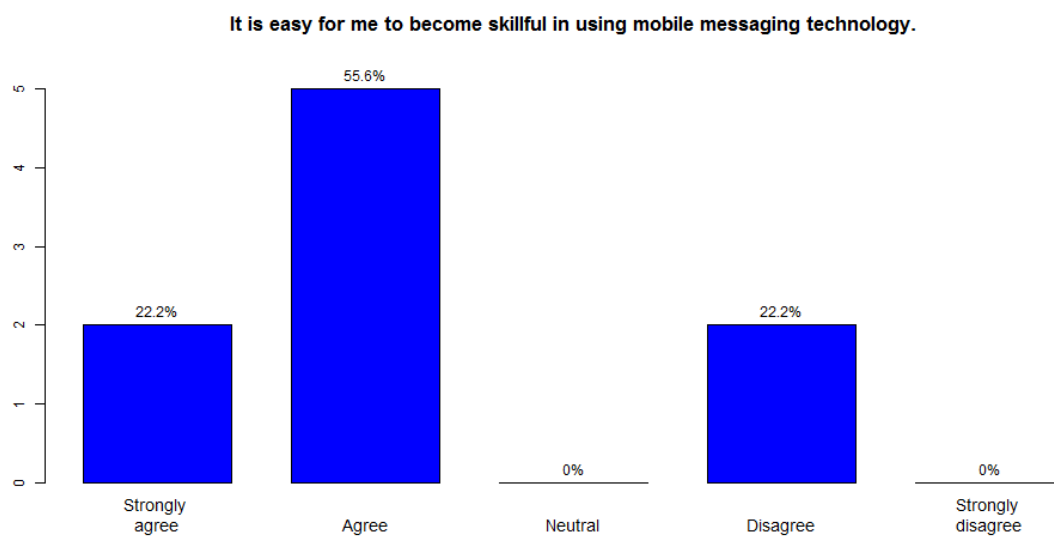


Figure 4.39 illustrates 77, 8% of the teachers surveyed agreed, and 22, 2% of the teachers disagreed that it is easy for them to become skillful in using MMT. Ndlovu and Lawrence (2012: 6) state that teachers in most South African public schools have attended some type of ICT training. Nevertheless, they are not maximizing the potential of ICT training and not using the skills they acquire from the ICT training to tailor make lessons that will extend or improve learning.

Figure 4.40: Illustration of how easy students find it to use mobile messaging technology to do what they want it to do

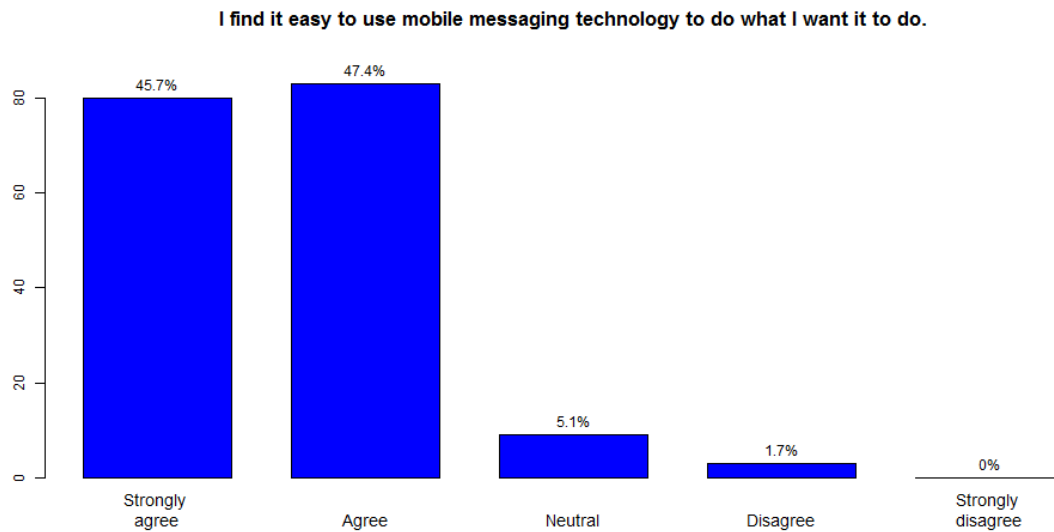


Figure 4.40 reveals that 93, 1% of the students surveyed find it easy to use MMT to do what they want it to do, and 1, 7% disagreed. 5, 1% of the students were neutral. The Web is emerging to become more like an area for social and idea networking, meaning students share concepts within Web 2.0 social spaces or idea networks, exchanging and creating content, in collaborative, new ways. O'Reilly's research in 2005 (cited in Duffy, 2008) indicates that user-centered Web 2.0 phenomena (YouTube, Wikis and Blogs) are disrupting traditional ideas about how students interact online and how content is generated, shared and distributed.

Figure 4.41: Illustration of how easy teachers find it to use mobile messaging technology to do what they want it to do

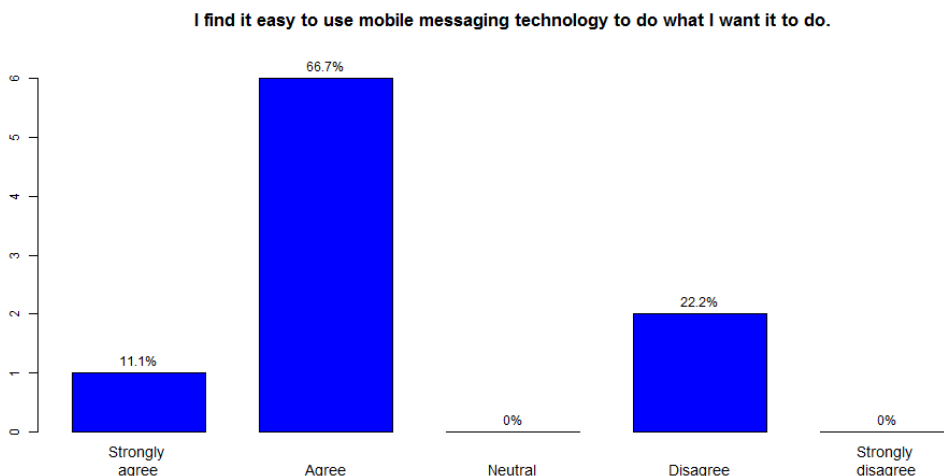


Figure 4.41 shows 77, 8% of the teachers surveyed indicated that they find it easy to use MMT to do what they want it to do, and 22, 2% were neutral. Aslanian and Clinefelter (2012: 5) state that technology can deliver personalized experiences on a massive scale. [It] has already provoked revolutions in health care, government, manufacturing, marketing... and it would be a strange quirk of the universe if somehow education were exempt.

4.3.2.5 Determining respondent's intention to use mobile messaging technology

Questions 18 to 19 from Section B of the questionnaire evaluate the respondent's intention to use MMT.

Figure 4.42: Illustration of how the students intend to use mobile messaging technology every day, whenever possible

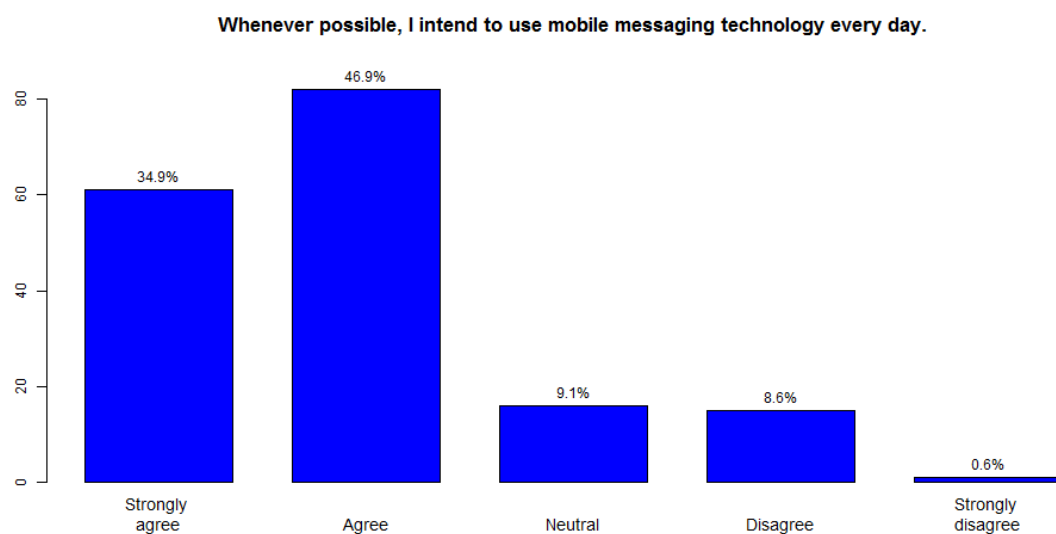


Figure 4.42 illustrates 81, 8% of the students surveyed agreed that they intend to use MMT every day, wherever possible. Meanwhile, 9, 2% disagreed and 9, 1% were neutral. This signifies that the respondents intentions to engage in technology, specifically mobile phones are proportionately high. The future of mobile technology in education is looking optimistic.

Naismith et al. (2004: 5) state that mobile technologies are becoming more fixed, pervasive and networked, with enhanced capabilities for rich social interactions, context awareness and Internet connectivity.

Such technologies can have great impact on learning; however the challenge will be to discover how to use the efficacy of mobile technologies to transform learning into a seamless part of daily life, so that it is not recognized as learning at all.

Figure 4.43: Illustration of how the teachers intend to use mobile messaging technology every day, whenever possible

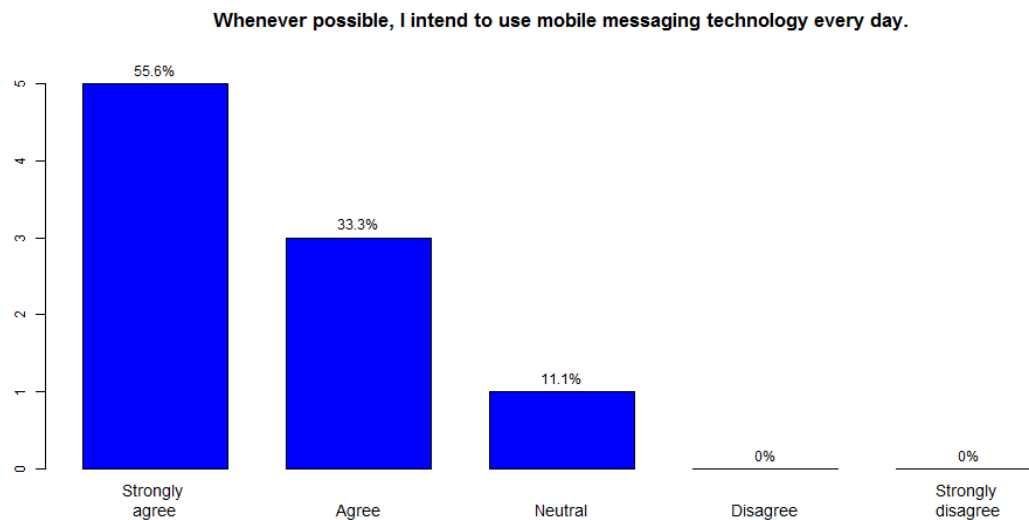


Figure 4.43 illustrates that 88, 9% of the teachers surveyed agreed that they intend to use MMT every day, wherever possible. 11, 1% of the teachers indicated that they were neutral. Naismith et al. (2004: 5) state that there is considerable interest from educators and technical developers in exploiting the unique capabilities and characteristics of mobile technologies to enable new and engaging forms of learning.

Figure 4.44: Illustration of how the students would use mobile messaging technology to do different tasks / assignments

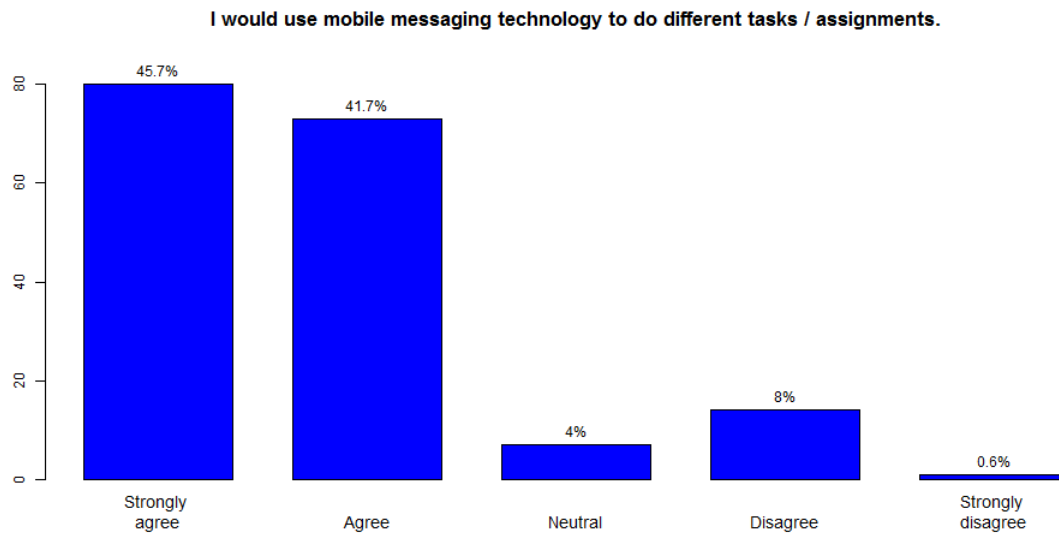


Figure 4.44 shows that 87, 4% of the students surveyed agreed that they would use MMT to do different tasks or assignments. 8, 6% disagreed and 4% were neutral. Naismith et al. (2004: 7) indicate that these devices are used dynamically, in many different settings, giving access to a broad range of uses and situated learning activities. The personal nature of these technologies means that they are well suited to engaging learners in individualized learning experiences, and to giving them increased ownership (and hence responsibility) over their own work.

Figure 4.45: Illustration of how the teachers would use mobile messaging technology to do different tasks / assignments

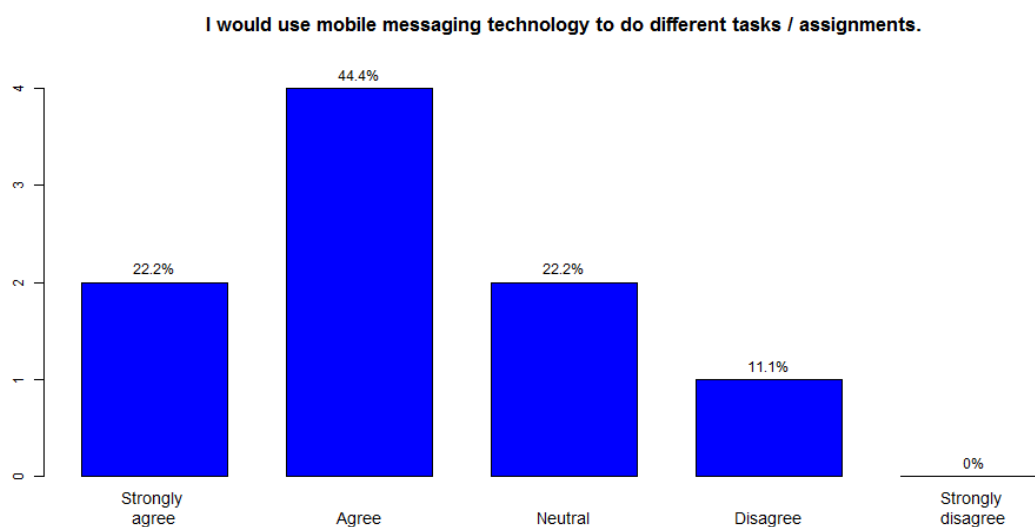


Figure 4.45 shows 66, 6% of the teachers surveyed indicated that they would use MMT to do different tasks or assignments. Meanwhile, 11, 1% of the teachers disagreed and 22, 2% were neutral. Naismith et al. (2004: 11) state that the use of mobile devices also means that even the most basic activities can be embedded within a meaningful learning context. This is illustrated by classroom response systems (CSR), which is a technology that implements cooperative learning and enables students to participate in the learning process.

4.3.2.6 Determining respondents mobile messaging technology self-efficacy

Questions 20 to 22 from Section B of the questionnaire evaluate the respondent's MMT self-efficacy. The data from these questions sought to answer research objective four.

Figure 4.46: Illustration of student's attitude toward completing a task / assignment using mobile messaging technology if the student had seen someone else using it before trying it themselves

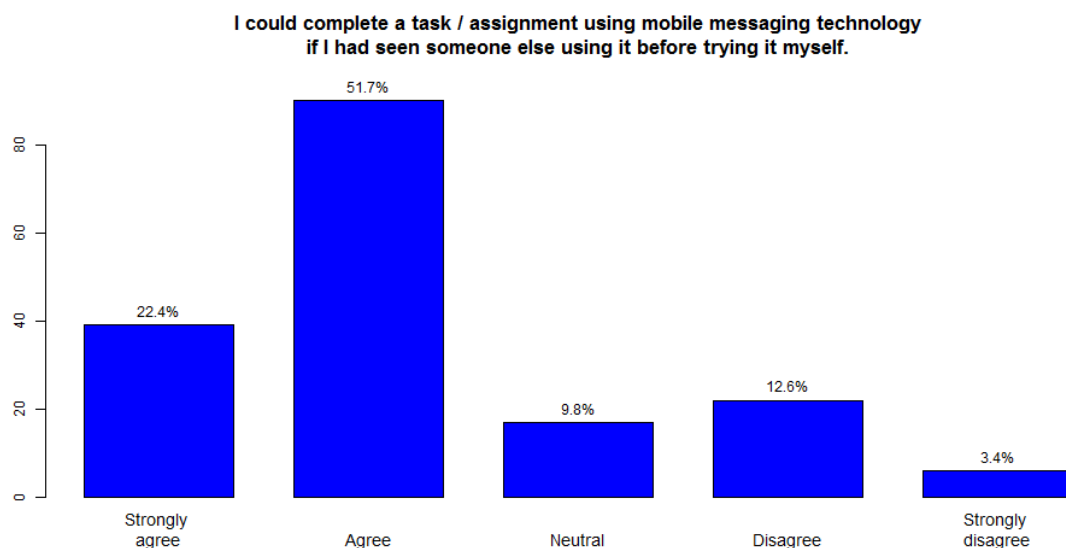


Figure 4.46 reveals 74, 1% of the students surveyed indicated that they could complete a task / assignment using MMT if they had seen someone else using it before trying it themselves, whereas 16% disagree, and 9, 8% are neutral. Teaching and learning with mobile phones has begun to make a breakthrough from pilot tests to departmental and institutional implementations.

Naismith et al. (2006: 34) note that usability should account for both, the users that will be creating the mobile content to teach, and those who will be using the mobile content to learn.

Figure 4.47: Illustration of teacher's attitude toward completing a task / assignment using mobile messaging technology if they had seen someone else using it before trying it themselves

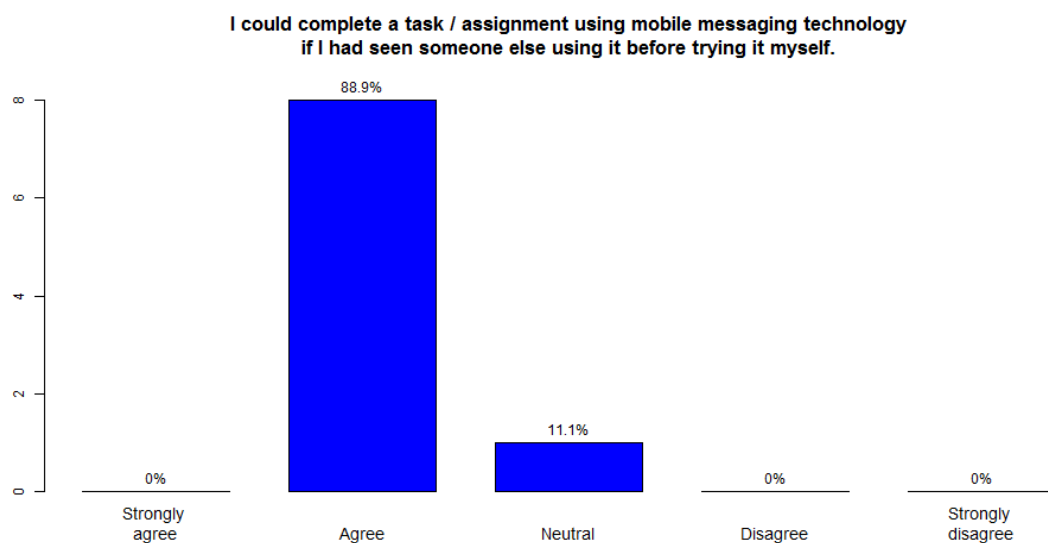


Figure 4.47 reveals 88, 9% of the teachers surveyed agreed, while 11, 1% of the respondents were neutral that they could complete a task / assignment using MMT if they had seen someone else using it before trying it themselves. Ongoing training and technical support should be provided to South African teachers to ensure that they use technologies, not specifically mobile technologies to improve current and new instructional content and activities. In their research Naismith et al. (2006: 35) suggests that specialist training and dissemination of good practice is necessary in order for staff to exploit the whole range of capabilities that mobile computing can offer.

Figure 4.48: Illustration of student's attitude toward completing a task / assignment easily if the student could contact someone for help using mobile messaging technology if they got stuck

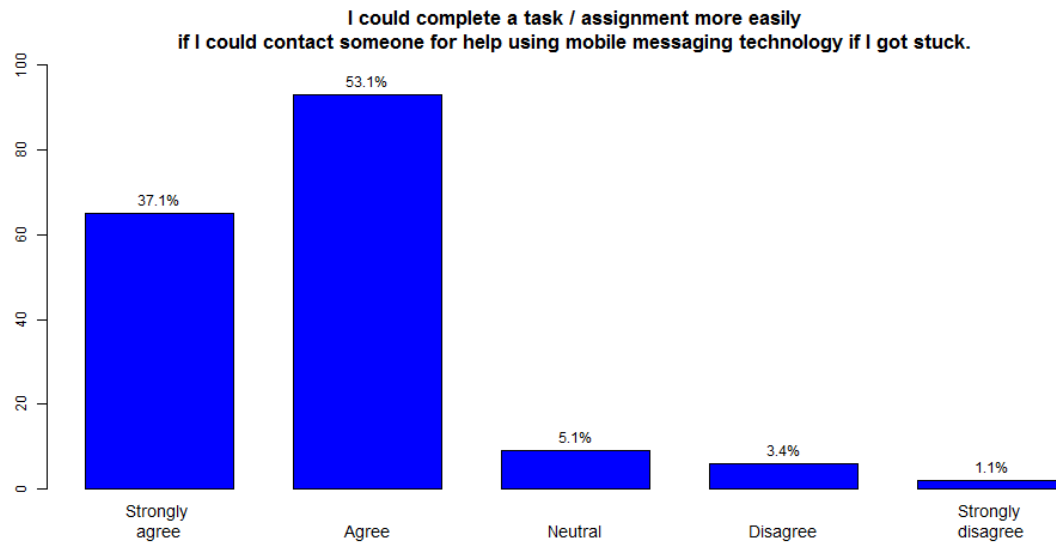


Figure 4.48 illustrates that 90, 2% of the students surveyed agree, 4, 5% disagree, and 5, 1% are neutral that they could complete a task / assignment more easily if they could contact someone for help using MMT, if they got stuck. The success of teaching and learning with mobile technologies will be measured by how flawlessly it is integrated into the student's daily lives.

The future of teaching and learning with mobile technologies will greatly enhance and create opportunities for distributed collaboration and mobile team working. In their research Naismith et al. (2006: 36) noted that students will be able to manage the administration of their learning through consultations with their institution- based virtual learning environments, and enhance their ability to instantly publish observations and reflections as digital media.

Figure 4.49: Illustration of teacher's attitude toward completing a task / assignment easily if they could contact someone for help using mobile messaging technology if they got stuck

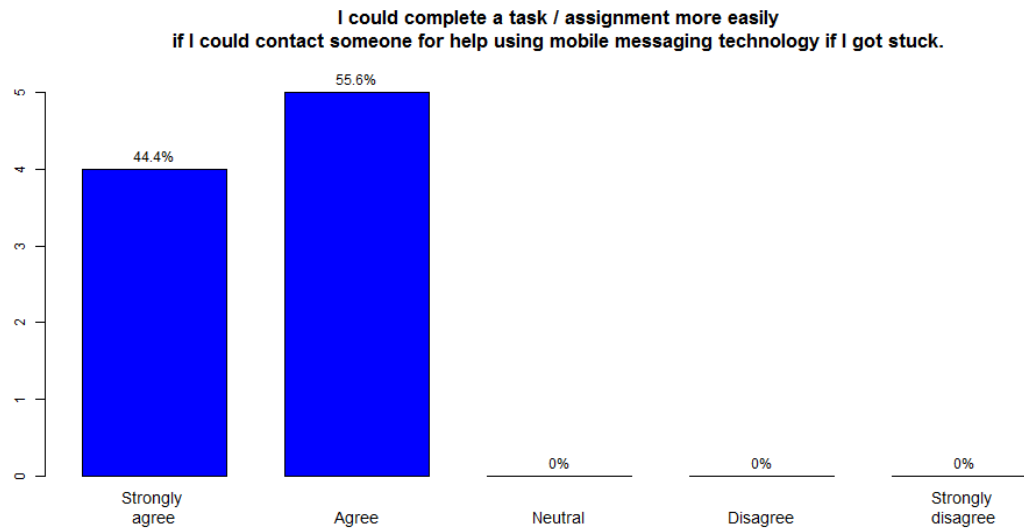


Figure 4.49 shows 100% of the teachers surveyed agreed they could complete a task / assignment more easily if they could contact someone for help using MMT, if they got stuck.

Figure 4.50: Illustration of student's attitude toward completing a task / assignment using mobile messaging technology, if someone showed the student how to use it first

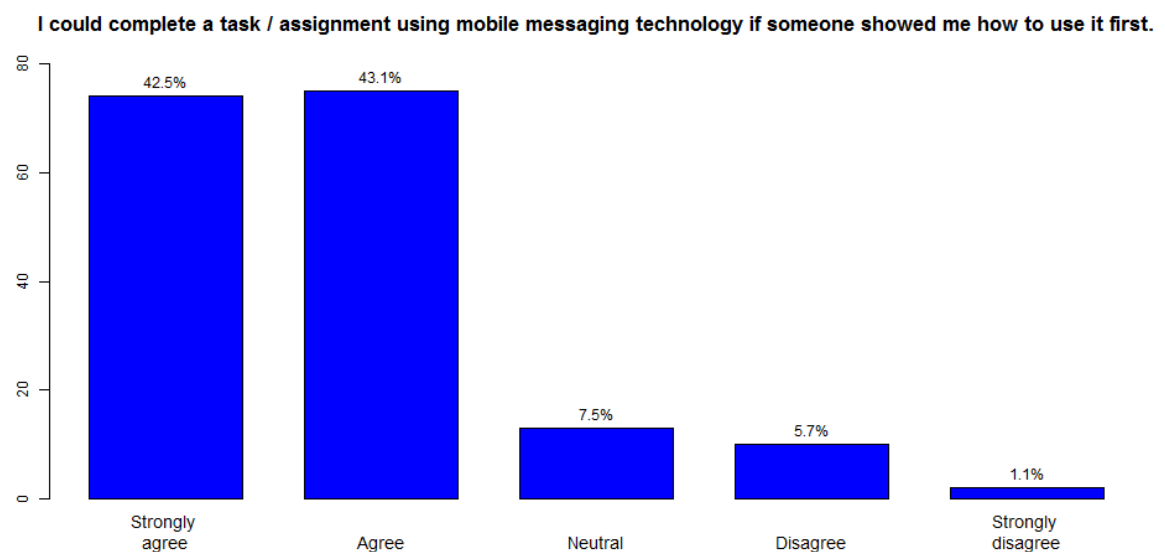


Figure 4.50 shows that 42, 5% of the respondents strongly agree, 43, 1% of the respondents agree, 7, 5% of the respondents are neutral, 5, 7% of the respondents disagree, and 1, 1% of the respondents strongly disagree that they could complete a task / assignment using MMT, if someone showed them how to use it first.

Figure 4.51: Illustration of teacher's attitude toward completing a task / assignment using mobile messaging technology, if someone showed them how to use it first

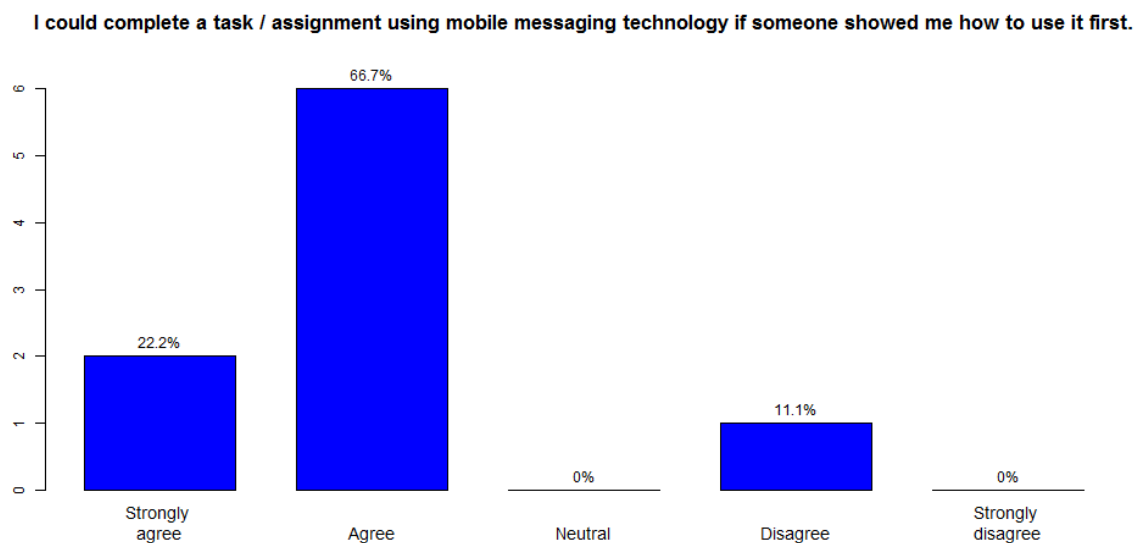


Figure 4.51 illustrates 22, 2% of the respondents strongly agree, 66, 7% of the respondents agree, and 11, 1% of the respondents disagree that they could complete a task / assignment using MMT if someone showed them how to use it first.

4.3.2.7 Determining the efficacy of mobile messaging technology as a new way of teaching and learning

Questions 23 to 25 from Section B of the questionnaire evaluate the effectiveness of MMT as a new way of teaching and learning. The data from these questions sought to answer research objective four.

Figure 4.52: Illustration of the student's attitude towards mobile messaging technology being important to teaching and learning

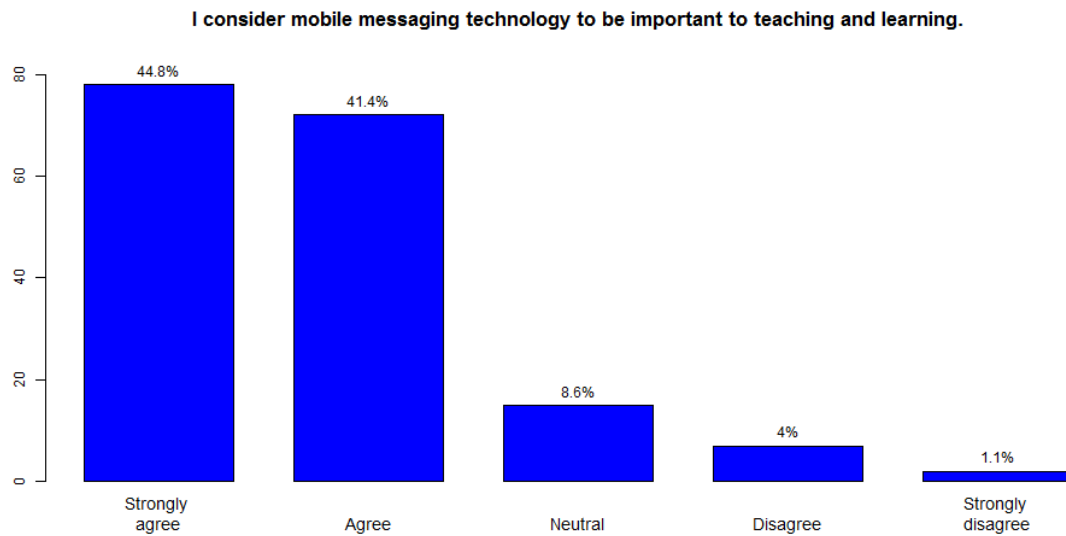


Figure 4.53 reveals 86, 2% of the students surveyed agreed, 5, 1% disagreed, and 8, 6% were neutral that MMT is important to teaching and learning. Mobile technologies used in the classroom can enhance teaching and learning and can bring about high effectiveness in teaching and learning, motivating the student to learn. Motivation plays an integral role, even a decisive role in human learning. In recent research Yan (2014: 394) notes that if learners cannot be driven by their instructive motivation then the efficacy of mobile learning will be heavily disregarded.

Figure 4.53: Illustration of the teacher's attitude towards mobile messaging technology being important to teaching and learning

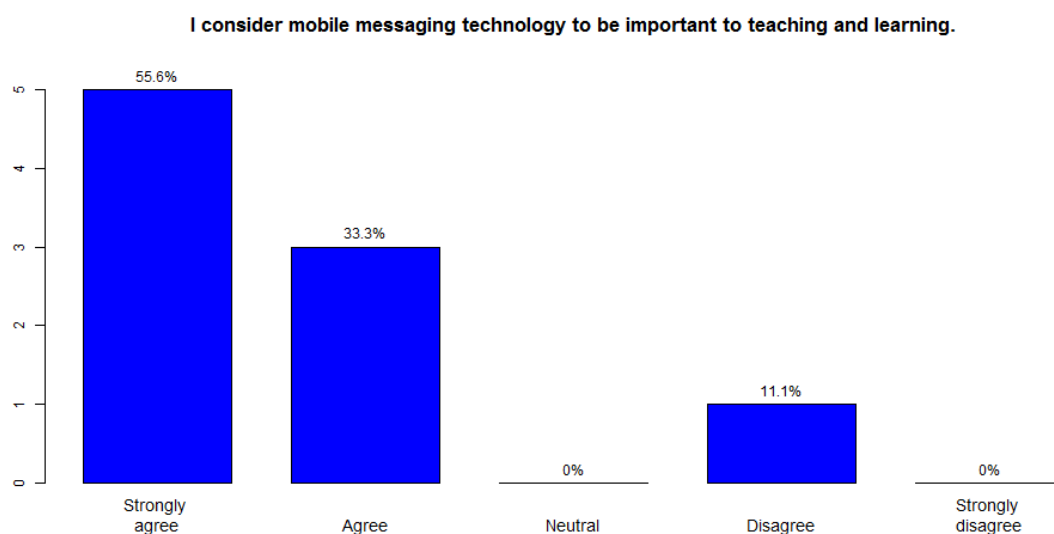


Figure 4.53 reveals 88, 9% of the teachers surveyed agreed, and 11, 1% disagreed that MMT is important to teaching and learning. Yan (2014: 393) stated that compared with other learning forms, mobile learning possesses the feature of easy access, individualised teaching, plentiful interaction and situational relevance.

Figure 4.54: Illustration of the student’s attitude towards mobile messaging technology being needed in their class

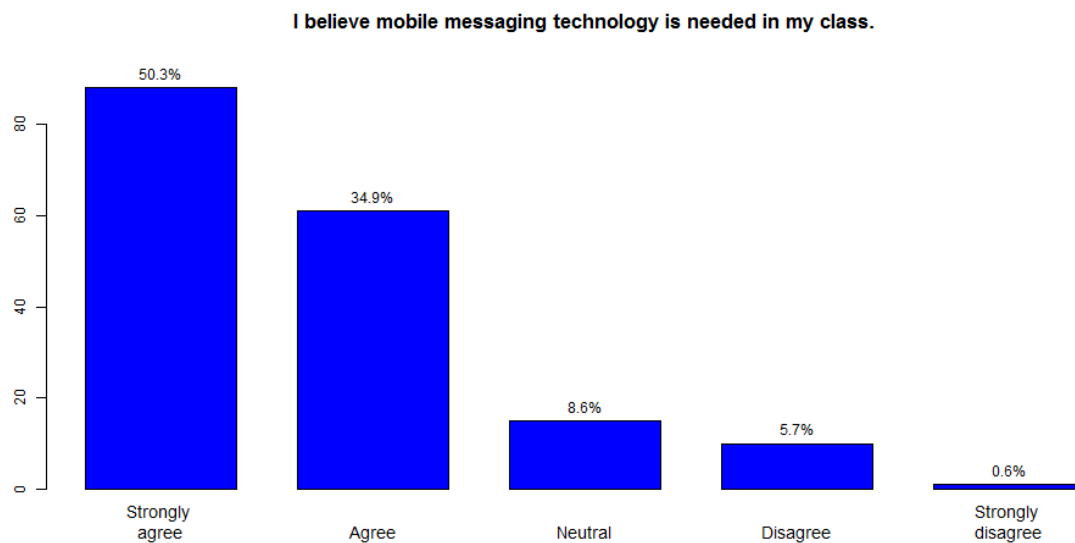


Figure 4.54 illustrates 85, 2% of the students surveyed agreed, 6, 3% disagreed, and 8, 6% were neutral towards MMT being needed in their classroom. The World Economic Forum (2014: 13) stated that ICT is a means to an end, which education seeks to serve. ICT offers new opportunities that are, and can be customised to different problems and populations. Its incorporation into the education arena may succeed in opening up education to populations that have had little access in the past.

Figure 4.55: Illustration of the teacher's attitude towards mobile messaging technology being needed in their class

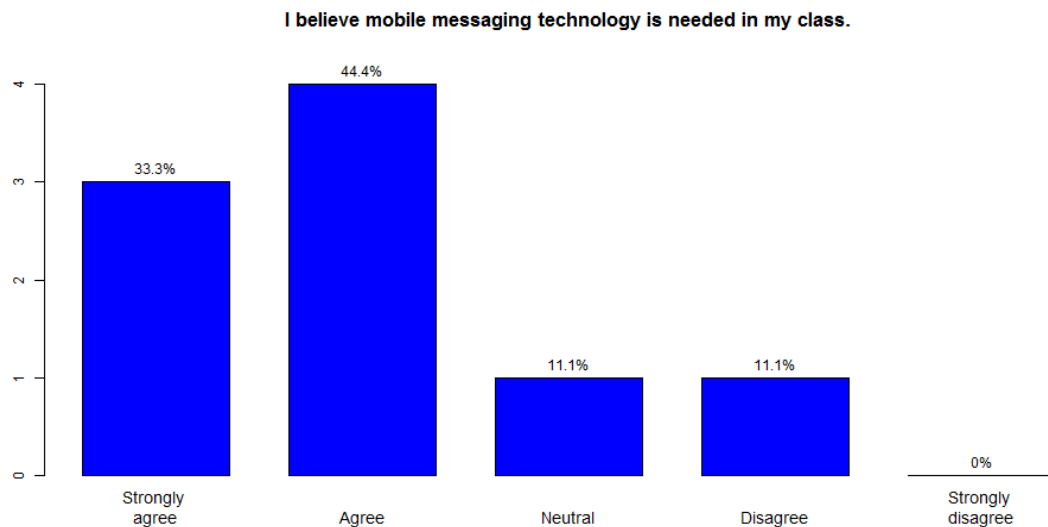


Figure 4.55 shows 77, 7% of the teachers surveyed agree, 11, 1% disagree and 11, 1% are neutral that MMT is needed in their classroom. The South African education leaders need to bring educational innovations to scale in South Africa. In recent research the World Economic Forum (2014: 33) stated that the traditional approaches to education delivery, which focuses on teacher-led instruction within the physical classroom, can no longer meet the challenges faced by the nation's educational sector.

Therefore, not surprisingly, there is enormous interest in the potential of ICT to mitigate these challenges by facilitating content delivery, quality improvements, and overall transformation in education delivery.

Figure 4.56: Illustration of the student’s attitude towards mobile messaging technology as a way to enhance their motivation to teach and learn

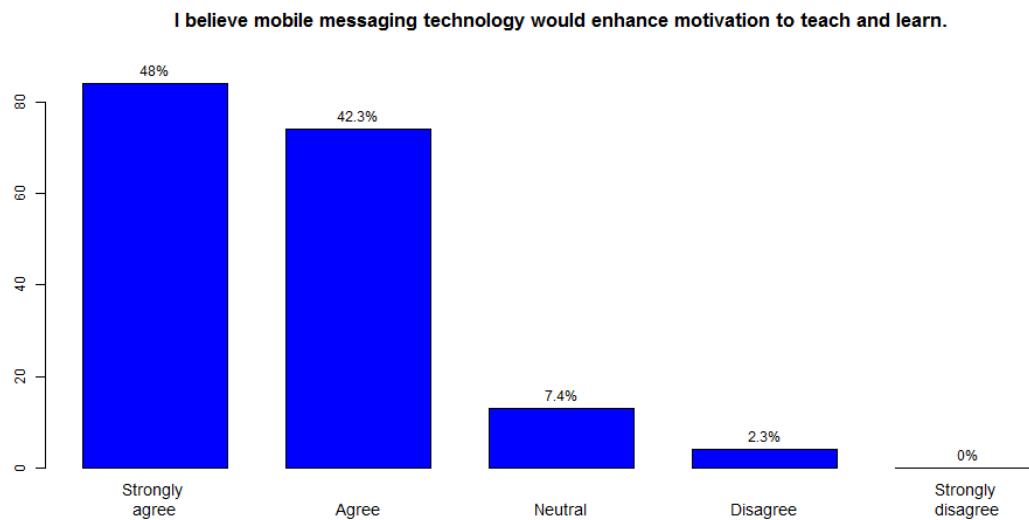


Figure 4.56 shows 90, 3% of the students surveyed agreed, 2, 3% disagreed and 7, 4% were neutral that MMT would enhance their motivation to teach and learn. In recent research, the World Economic Forum (2014: 66) states that with our new capacity to capture data and analyse it, we can now use data to deliver personalized, world-class education on a global scale.

Educational data mining can perform advanced “user-modeling” to determine what a learner knows, what a learner’s behaviour and motivations are, and how engaged the learner is with a given course. Learning analytics can determine when students are getting off-track, or when they’re becoming bored or frustrated.

Figure 4.57: Illustration of the teacher’s attitude towards mobile messaging technology as a way to enhance their motivation to teach and learn

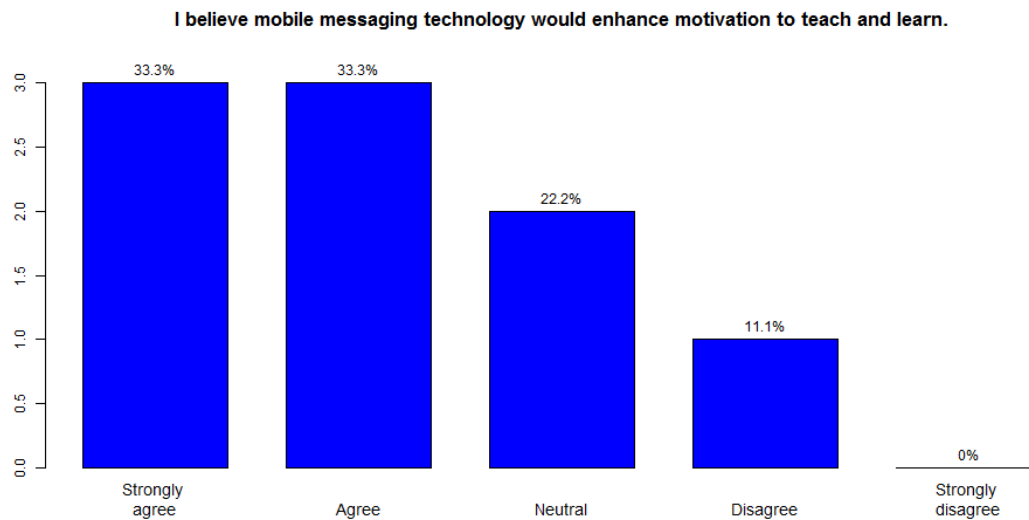


Figure 4.57 illustrates 66, 6% of the teachers surveyed agreed, 11, 1% disagreed, and 22, 2% of the teachers were neutral that MMT would enhance their motivation to teach and learn. The World Economic Forum (2014: 67) notes that by identifying and analysing patterns in educational data, technology can enhance teachers ability to profile learners into groups to allow for deeper understanding of each learner, so as to improve their learning experiences and outcomes.

4.3.4 Summary of analysis and interpretation of section B

The social media preferences for both respondents’, in order, are:

1. WhatsApp
2. Facebook
3. Google+ (student) and BBM (teacher)

Due to the advances in mobile technology, especially in improved functions, enhanced usability and networking features within specifically mobile phones, respondents are given access to content, anytime, anywhere and for free.

There is so much content to choose from via a mobile phone, consequently the respondents are able to participate in an informal 'idea' network, whenever, from wherever, for however long they choose.

Peer-to-peer teaching using MMT may be discretionary, nevertheless it is a credible method to help other students who are struggling to meet national education standards and require assistance from those who demonstrate competence and can teach the instructional content. The challenge is that using mobile phones to teach and learn is recognised as experimental, and not a traditional and formal pedagogy.

More than 80% of the respondents agreed to assist with developing breakthrough instructional material that is fundamental to growing and sustaining our economy and creating well balanced, engaged citizens. The efficacy of mobile technology allows respondents to record and upload ideas or content at any time and discuss it with peers. Mobile technology allows respondents to create, collect and organise social media dialogue around relevant instructional material, and furthermore build a learning environment that will arouse the student's interest.

Over 77% of the respondents agreed that using MMT makes it easier for them to do their work except this requires students to adjust themselves to become active, engaged and independent learners, especially learning via a novel method like using a mobile phone. The growth in mobile communication has made the medium of mobile technology a very popular communication medium and this has allowed the respondents much more freedom to perform their desired tasks.

In Figure 4.36, 89, 1% of the students agreed that learning to operate MMT was easy for them. Continuous disruptive innovation in digital media has brought about transformative change across the global education sector.

These digital innovations will improve teaching and learning experiences and expand access to quality education. A mobile learning environment must supplement the current learning system and not disregard experienced and trained teachers.

As discussed in Figure 4.18 and 4.19, respondents actively occupy much of their time connected online. These respondents frequently use their time online because mobile technologies, like mobile phones are pervasive and networked, which allow rich social interactions. The measure of success for using MMT to teach and learn should be determined by how sufficient the training is on how to integrate it into our classrooms to improve instructional content, facilitation, assessment and credentialing.

More than 70% of the respondents want to see MMT integrated into the classroom. MMT offers an important means to an end to what teacher-led mass education is trying to serve. MMT is opening up access to quality education to populations who are experiencing sub-standard public education, and who have had little to no access previously.

4.4 Summary

This chapter has enabled the researcher to make an attempt to retrieve a number of findings contained in both the interviews and questionnaires.

The usage of thematic analysis approach enabled the researcher to critically examine the data from the interviews, and to use the existing literature to explain and substantiate the findings.

The qualitative data analysis from this chapter produced a number of lessons about how industry stakeholders should implement MMT to train people on demand driven skills so they can apply themselves more effectively in the emergent economy. Moreover, the findings revealed how using technology in education derives its own challenges and concerns pertaining to the standards of communication, virtual security risks, internet accessibility, and strict standards and guidelines about using MMT to teach and learn must be met and maintained.

From the interviews, a variety of themes popped up and revealed the provision of skills development to prepare graduates upon employability, and the receptiveness towards using technology to develop skills in the workplace.

There is a shortage of intermediate and high level skills in the graduate talent pool, especially a shortage of graduates with the competences to cope within modern working environment demands. The effective implementation and utilisation of education technology could enable a culture of learning and innovation notwithstanding a number of challenges pertaining to verbal communication skills deteriorating, security issues and poor IT infrastructure.

The researcher closely examined the quantitative data analysis from this chapter, and used the existing literature to describe and support the findings. The data produced a number of findings about how MMT is an effective learning platform because it is an inexpensive, flexible and accessible communication and media sharing tool used universally for people to share instructional content, allowing for broader discussion of concepts, whenever, from wherever, for however long they choose.

It is technology and innovation that will improve teaching and learning experiences and expand access to quality education. MMT offers a means to an end to what teacher – led mass education is trying to serve.

Chapter 5 features the presentation of conclusions and recommendations.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The concluding chapter presents the findings of the literature study and the primary study previously presented. Conclusions are drawn from each research objective that has been investigated in the research study and is supported by the theoretical content provided in chapter two.

Based on the conclusions, the researcher identified and recommended opportunities and limitations of the study to help education stakeholders identify the significance of education technology in public FET colleges.

The study's findings, conclusions, recommendations and limitations are set out hereunder:

5.2 Findings of the literature study

Since 2008, for the first time in history, more than half of the world's population will be living in towns and cities, and by 2030 this number will grow to almost 5 billion, with urban growth concentrated in Africa and Asia. One of the biggest educational challenges over the next generation will be in the serious shortages in the creation and application of relevant human capital in megacities of the developing world.

It is essential for the leaders of South African education to modernize the current curriculum, and enable it by using innovative technology to facilitate demand driven competencies required to tackle the future competitive socio-economic landscape. Education policy makers must consistently encourage innovation using digital applications to penetrate and improve barriers to new methods of teaching and learnings.

Students can teach education policymakers about how the education ecosystem needs to change and adapt rapidly to the growing relevance and implications of technology based education platforms that can meet the needs of millions of young, disadvantaged students hungry to learn but starved of opportunity? Rigid mass education systems entrenched with underperformance and inequality can be transformed by designing and scaling promising learning models based on the students individual learning requirements, one with a collaborative learning platform that allows millions of students to interact and share new knowledge, at a low cost, on a vast scale

A contemporary mass education system requires teachers and schools to integrate technology into the curriculum to allow students to use and experiment with technology, interactive software and online education resources to prepare students for the next economy. One of the biggest challenges will be the rate at which education systems; especially South Africa's adopts the emerging trend of education technology

Senior education ministers need to work closer with social entrepreneurs to improve the barriers to education by planning in an era of access to quality education, supporting and investing in them to create mass education systems through using modern and innovative education technologies; incorporating computers, the Web 2.0, and mobile phones. The creation of a knowledge-based society is a result of the advancement of the information age. It has been driven by the power of an easily accessible global network to connect. This has given rise to a booming culture of online collaboration, social networking and user-generated content.

While digital technology makes education possible, it remains itself perceived as an inferior way to learn by parents, schools and communities in developing countries. Before education leaders begin to redesign and scale a promising learning model they must be encouraged to engage in ethnographic research to start building data and a technical understanding of people's attitudes towards using a digital learning environment to teach and learn, especially the needs of student's so as to co-design and co-deliver better methods, which are relevant and motivate the learners.

So, in order for South Africa to build a learning society, its education system needs to create new technologies to foster an inter-connected learning society, between all stakeholders, to be able to provide a platform that supports a system of continuous innovation and feedback

5.3 Findings from the primary study

MMT is an excellent informal training methodology, mainly for wide-reach communication due to cell phone availability, cost efficiency, however it is unable to replace practical, experiential skills development methods. Most participants noted that sharing of information over the web to students is achievable because it required limited time and effort, however the success of sharing business knowledge with students depends on these senior manager's involvement, engagement, and security concerns

Most participants indicated that MMT is an appropriate medium to teach and learn. MMT is engrained in our current generation and participants indicated the need to make technology relevant to employees to teach and learn. It is dependent on the purpose of the technological use and the constant involvement and time required to assist.

The education system needs to communicate through emerging and relevant methods but this would require the access and affordability of education technology to be improved, and a change in institutional attitudes to start using such technologies. Technological advances, specifically in the mobile technology industry have resulted in improved mobile technology features and functionality that enable the exchange and collaboration of content on a massive scale through mobile messaging platforms like WhatsApp.

It is mandatory to train teachers how to maximise the use of innovative teaching and learning applications, like MMT but ensure that it satisfies both, student and teachers demands.

This can be supplemented by data derived from education technology used in the education sector to determine a deeper understanding of each learner's emotional and rational needs to increase their customer experience to become a lifelong learner.

5.4 Conclusions drawn

The conclusions set out below are used to satisfy each research objective

5.4.1 Objective One: To investigate the impact of the business skills shortage in the FP&M sector upon FET graduates employability in the emergent economy

The study distinctively reveals the strategic importance and provision of skills development to impact the supply and demand of quality graduates upon employment. The study requires more attention regarding the merits and de-merits of industry stakeholder's towards using MMT to teach and learn workplace skills.

This study explains how important it is to maintain the quality and standard of information sharing when using MMT as an education application in the workplace.

5.4.2 Objective Two: To investigate the attitudes of financial management students from a Durban FET College towards mobile messaging technology as a strategic teaching and learning tool

No respondents showed an overall disagreement with the idea of MMT as a teaching and learning platform. This distinctively reveals that the students of this particular FET College support the idea of expanding the use of MMT as a teaching and learning platform.

5.4.3 Objective Three: To investigate the attitudes of financial management teachers from a Durban FET College towards mobile messaging technology as a strategic teaching and learning tool

The study indicated an overall attitude of ‘agreement’ with MMT among the teachers as a teaching and learning platform. This study requires more attention regarding the teacher’s perceived ease of use, and intention to use MMT as an innovative pedagogy. It is imperative to note how government should employ effective models and build stronger policies for integrating ICT into the curriculum ensuring a sufficient number of teachers are trained to teach using ICT in the classroom.

5.4.4 Objective Four: To investigate the effectiveness of MMT as a technique of teaching and learning using a financial management programme of a Durban FET college

The study found MMT is a contemporary pedagogical tool, and supplements teaching and learning. The respondents distinctively revealed the efficacy of using MMT as a novel method for teaching and learning.

5.5 Recommendations

Based on the findings of the literature review and the field study, the researcher puts forward the following recommendations to South Africa’s education leaders and policy makers on the importance of expanding and utilizing education technology as a teaching and learning platform in public FET Colleges, to start preparing student’s upon employment in the information age.

5.5.1 Recommendation One: Expand the integration of technology into the curriculum to enable students to develop the human capital for employment in the information age.

The researcher invites the following actions:

Youth in sub-Saharan Africa faces enormous challenges accessing decent livelihoods.

Global employment trends (cited in International Youth Foundation, 2012: 12) found that the overwhelming majority of workers in sub-Saharan Africa (76%) are working at low-skilled, low quality jobs that do not pay enough to lift them out of poverty. The state, employers and individuals should be incentivized to invest in the development of student's human capital by offering work experience to develop particular skills within the academic and employability skills spectrums.

UN World Population Prospects research (cited in International Youth Foundation, 2012: 13) states from 2010 to 2015, the number of youth in sub-Saharan Africa will grow by more than 19 million people. It is the duty of both the state and employers to enable the delivery of skills development targets [in South Africa] in order to mitigate the huge inconsistency between the graduating students employability and the extent to which industry stakeholders believe that these students have developed the appropriate skills.

In the foreseeable future, the informal sector is where the young people are likely to earn their living. As a World Bank (2011) paper stated, "informal will be normal". It is essential to build partnerships and collaborate within and across sectors to build capacity to innovate at a level that matches the scale of the challenge by planning and ensuring how students are prepared for the 21st century. The International Labour Office (ILO) (2010:31) indicates people working in self-employment, including those in rural areas and in the informal economy, together with people in irregular work and precarious employment, should also have access to skills development and lifelong learning programs.

It is essential that the South African education policymakers ensure that qualified teachers are retained, and appropriately inducted and skilled in using educational technologies to create other areas of skill and knowledge that are less often developed on course such as computer literacy, technology fluency and global networking.

The World Summit on the Information Society (WSIS) was a pair of United Nations-sponsored conferences for the 'ICT for development' community. The conference revealed how it is essential to expand the curriculum to adapt to the current market needs of both the graduate and employer and the challenges of the information society (WSIS, 2014:231).

Government should insist on the participation of stakeholders from public and private sector in reshaping and redesigning the mass education model and its curriculum in order to provide better work integrated learning opportunities for graduates; and guarantee an average increase in graduates digital technology competence, and to start mentoring and coaching young people to advance their socio-economic opportunities. In its research the International Labour Office (ILO) (2010) indicated how effective partnerships between governments, employers, training institutions and providers are critical to anchor the world of learning within the world of work.

The Development Bank of Southern Africa (2011) stated that without the capacity or the resources to make a meaningful impact reveals the state and industry's inability to develop meaningful sector strategies that are achievable and practical. Given the size and urgency of the problem, a national partnership on experimenting with open education technology to enable a more progressive and interactive learning ecosystem linked to appropriate human capital is long overdue. It is essential that the government establish measureable and manageable policies to use educational technology to provide new support to teaching and learning.

Adapting curricula to integrate ICT requires emphasis on design, development and implementation of instructional approaches that provide multiple means of representation and multiple means of student engagement. Countries need to adapt all basic and higher education curricula to meet the challenges of the information society, taking into account national circumstance (WSIS, 2014). Government should design, develop, and deploy a curricula built for the information age that simulates supervision and creates a more effective approach for developing mastery thus transforming how students learn in the 21st century. And, then take the best-proven practices to scale, and expand it locally, regionally and nationally.

It is essential that the public and private sector collaborate with each other to develop and publish analytical data that measures the effectiveness and receptiveness of schools that have implemented open education technology in the classroom. They can utilize this information to radically exploit and expand opportunities to advance the curriculum in places that are ill-served by poor public services.

In order for effective teaching to take place in the classroom, and to facilitate a broad spectrum of skills, teachers have to have access to better teaching repertoires.

This includes for instance, working effectively in inclusive settings, applying learner-centered pedagogies, and more effective uses of ICT and open educational resources within the curriculum (European Commission, 2014).

5.5.2 Recommendation Two: Use MMT as an educational tool to impact students accessibility to demand-led skills essential to survive in the information age

In 2012, the United Nations Development Programme (UNDP) estimated that ICTs could be accessible to everyone by 2015. Summarily, we are witnessing a change of tide. This is an era of open access to innovative ICT channels, propelled by state-of-the-art technologies and diminishing barriers to entry. Zuckerman's research in 2009 (cited by UNDP, 2012) confirms an estimated 80 – 90% of people in some poor countries have at least minimal access to a cell phone, and at least 60% of the people who live in the least developed countries are covered by a mobile network. Mobile phones require basic literacy making the barriers to entry lower than with other modern ICT. The portability and ubiquity of mobile phones have helped governments mobilise and network *geographically* dispersed people (UNDP, 2012).

It is recommended to adapt and expand how students think and feel toward using MMT in class because it has enabled huge impact on human development. The UNDP (2012) confirmed that mobile applications are being used to combat poverty by expanding service delivery possibilities, like in education. Public investment and public private partnership are essential for extending connectivity, services and information.

The World Economic Forum (2014: 64) states, today, digital innovation is driving unprecedented change across the education sector, in doing so, it has the potential, both to improve student learning outcomes and expand access to high quality education opportunities in ways that would have been unimaginable even a decade ago. The South African government can use these mobile technologies to expand the reach and extent of access to instructional information and service distribution to rural areas that are hard to access. The UNDP found that even within the constraints of literary challenges and infrastructure limitations mobile technologies are offering marginalized groups of people innovative ways to leverage their resources to enter the marketplace (UNDP, 2012).

WSIS confirmed that ICT, solely, could not provide the education that students need to become more productive citizens; rather ICT enhances the quality of learning and facilitates the improvement of teaching and learning by reforming the traditional pedagogy. Policies and plans are needed that will enable pupils, through the acquisition of appropriate skills, to effectively participate in a globally competitive workplace (WSIS, 2014). A broader educational policy needs to be implemented to help realise the development potential of this medium to develop the human capital to survive in the years to come (UNDP, 2012).

The ILO (2010: 40) stated that Ministries of education and its policy makers continue to deal with intractable problems that require better diagnostic tools and understanding of policy: for example ensuring that education and training lead to improved employability. These stakeholders must start exploring the advancements in technology and Internet access in education. Mobile technology applications like WhatsApp and WeChat are rapidly expanding due to their inter-connected, pervasive network capability permitting them to become very common communication mediums.

WSIS demonstrates that capacity building through e-learning initiatives will be an important precondition for the development of skills in the information age (WSIS, 2014).

It is recommended that schools, educators and students start to experiment with a variety of mobile application functions and features to allow students to make notes on their own, record and share multi-media files with other students who are simultaneously using the virtual learning platform to collect, organise and publish sufficient instructional material as digital media. The UNDP (2012:30) suggested that mobile technologies, in connection with Internet access would permit customised learning by supporting the creation of wireless communication, study groups and educational networks.

5.5.3 Recommendation Three: Provide educators sufficient training and support to utilize open education technology to facilitate modern-day, demand-driven skills to meet the needs of the emerging information society

The utilization of online tools to supplement teaching and learning is not yet a recognised and encouraged pedagogy in South Africa's public FET Colleges. Ndlovu and Lawrence (2012: 4) noted that [South African] teachers do not have the appropriate knowledge to stimulate the advancement of learner thinking process through the integration of online tools into their teaching.

It is essential that South African teachers are inspired and guaranteed the opportunity to develop their ICT skills and competences, which are demanded by a rapidly changing global market. A benefit would be that more domestic and national policies are institutionalized to permit teachers, through the development of appropriate ICT skills, to effectively offer an ICT integrated curriculum improving the conditions of learning and professional contemporary skills. Thus, it is essential South African teachers begin developing the practices and know-how on how best to leverage open education technology amongst students.

Sica et al. (2011: 169) noted that it is crucial to identify strategies of using technology that will be appropriate and consistent with the target of the intervention, in order to produce effective teaching strategies and able to stimulate a real path of “active processing” of information.

South Africa's Department of Education, its policy makers and teachers need to focus on innovative ways of integrating mobile technologies into development agendas as their lower cost potentially increases scalability, opening up new opportunities to connect people to free services like online education, via mobile phones reaching historically disadvantaged communities (UNDP, 2012). It should be compulsory for the development of ICT skills amongst South African teachers, and to best explore the potential of open education technology to mitigate the barriers to access and participation in quality education. The interaction of both, smart phones and humans can augment the students' motivation and initiative to learn, and furthermore can build a vivid and visualized learning environment through multiple sensory stimulation i.e. images, text, sound bites and videos to arouse the student's interest.

However, the World Economic Forum (2014:68) states that education is such a high stakes industry that practitioners are reluctant to try unproven innovations in education that could possibly lower outcomes. Moreover, in education in particular, people are attached to longstanding habits and strongly defended interests that also slow innovation.

It is imperative that the South African education system examines how mobile devices offer more direct ways for teachers and students to interact with instructional material in an authentic learning context. Wang (2014: 13) states that teachers feel insecure because of the fear that mobile networks will threaten their roles as teachers, and rather prefer face-to-face communication to receive an immediate response and make quick decisions. Nevertheless, South African teachers need to improve the quality of their use of ICT competences to improve learning. Aslanian and Clinefelter (2012: 5) state that technology has already fomented revolutions in health care, government, manufacturing, marketing...and it would be a strange quirk of the universe if somehow education were exempt.

Sharples' research in 2003 (cited in Naismith et al. (2004: 6) suggests that rather than seeing mobile technology as disruptive devices, educators should seek to exploit the potential of the technologies children bring with them and find ways to put them into good use for the benefit of learning practice.

In their research Naismith et al. (2006: 35) suggests, in order for mobile technologies to complement teaching and learning in South Africa both, teachers and students need suitable time to become familiar with these new devices and their capabilities. South Africa's Ministers of education and their policymakers need to relook at how mobile learning has the following advantages comparable to traditional teaching:

- Has a strong interactive advantage
- The construction of mobile learning communities
- The advantage of rich and available learning resources
- It is open and not limited by anywhere or anytime
- Has the advantage of learning autonomy

5.5.4 Recommendation Four: Use MMT as an informal pedagogical application to tutor students to prepare them for the transition into the world of work

Technology and innovation have equally driven the changes in the pervasive use of information but there are a few areas that technology and innovation have not been subject to constant innovation and improvement, especially in basic and tertiary education (ILO, 2010).

The senior leaders and policy makers of South Africa's education system need to have continuous negotiations between the labour market, particularly employers, trainers and higher education training institutions on developing a policy prioritizing technology in its education system, which links occupationally directed skills taught in school and universities to contemporary workplace skills requirements, and ensure the broad access to pragmatic training opportunities, particularly for those groups facing greater difficulties, especially in rural communities.

It is essential that the South African education system, its teachers and specialists explore how open education technology can augment and supplement a student's learning experience, and transmit reliable and current instructional content at the finger tips (or disposal) of students to help them to make better informed decisions with the use of this information.

Open education technology, especially MMT has the ability to address some key universal obstacles like high resource costs and limited access to quality education for marginalized groups beyond the physical location of a classroom.

In their recent research the European Commission (2013: 22) stated that computer based learning in education assisted in student learning because it allowed teachers to assign different work to students based on their individual needs. Implementing virtual based learning through the South African curriculum will forego the prescribed pedagogy currently used in the South African education system, which inherently teaches a blanket approach and does not accommodate the individual learners needs, particularly the students that have special education needs, which, at the end of the day does not ultimately provide a desired customer learning experience.

It is vital that the South African DoE craft developmental strategies that prioritizes the implementation, monitoring, measurement and evaluation of education technology in schools, public colleges and universities so as to start producing the technological fluency, global networking skills and digital media competences of students in a globalised market, who are transitioning into the new world of work.

Mobile technologies, in connection with Internet access, can help modify learning by supporting the creation of social media dialogue, work-study groups and educational networks.

South Africa's education system should begin with small-scale experiments using open education technology in schools, as a means to tutor students, specifically MMT, since it is one of the world's most common mediums to communicate and transmit information within a collaborative environment. Butgereit's research in 2009 cited in UNDP (2012: 29) states that in South Africa, Dr. Math, which is a mobile mathematics-tutoring program, uses MXit instant messaging platform to allow students to submit math problems to tutors.

It is important to use MMT as a pragmatic solution to tutor students to improve productivity, and develop stronger links between changes in the demand for contemporary skills required in the workplace, and facilitate the provision of good quality education.

5.6 Study limitations

The following limitations could possibly have influenced the findings of the study. The researcher was restricted by a lack of resource, particularly the amount of time available to devote to the study. Likewise, the researcher could have used a research assistant to survey the respondents; particularly the students to help them interpret the research study questions because the student's limited ability to read and understand the technical questions possibly affected the validity of their responses.

5.7 Recommendations for future research

This study essentially focused on how receptive students and teachers from an urban area were to the novel method of using MMT to teach and learn—whereas rural areas were not involved in the study. It would be important to similarly examine, measure and evaluate how receptive students and teachers from rural areas were to using MMT as a new method to teach and learn. While this would have challenges it would be interesting to note how MMT could supplement teaching and learning in rural areas. Future research concerning this area of interest would be beneficial to the development of the local and regional education system in the rural areas.

5.8 Summary

It is evident that technology and innovation, particularly mobile technology is transforming education by objectively providing sufficient and relevant content in a manner that is customised to each individual learners needs. The main areas of focus to counteract are the challenges raised by traditionalists regarding the substandard measures of teaching and learning with mobile technologies. Given the use of technology to teach and learn, not only policymakers but private business must be conscious of the required teaching and learning standards and guidelines, and to make certain that a plan and process is in place to ensure these standards and guidelines are maintained. Therefore, it will be required to measure, evaluate and report how flawlessly mobile technology is integrated into the teachers and students daily lives, and the classroom.

On condition that MMT is correctly implemented in schools, it can have a great impact on virtual learning and can produce positive outcomes, for example ensuring groups of people, including traditionally underserved or marginalized groups can access quality education. This view has been supported in the work by WSIS (2014).

Bibliography

Aditya Birla Group, 2014. *From Market Driven to Market Driving*. [online] Available at: < <http://www.adityabirla.com/Media/From-market-driven-to-market-driving> > [Accessed 12 May 2014].

Africa's Pulse: *An Analysis of Issues Shaping Africa's Economic Future*. World Bank, Office of the Chief Economist for the Africa Region, September 2011.

Apple, 2014. *Apple in Education Profiles*. [online] Available at: < <http://www.apple.com/education/real-stories/essa/#video-essa> > [Accessed 14 May 2014].

Aslanian, C.B., and Clinefelter, D.L., 2012. *Online College Students 2012: Comprehensive Data on Demands and Preferences*. [online] Louisville, KY: The Learning House, Inc. Available at: <<http://www.learninghouse.com/files/documents/resources/Online%20College%20Students%202012.pdf>> [Accessed 13 August 2014].

Association for Educational Communications and Technology (AECT), 2004. *The Definition of Educational Technology*. [online] Washington, DC: AECT. Available at: < http://ocw.metu.edu.tr/file.php/118/molenda_definition.pdf > [Accessed 20 November 2014].

Barber, M. Donnelly, K. and Rizvi, S., 2012. *Oceans of innovation: The Atlantic, the Pacific, Global leadership and the Future of Education*. Available through: Institute for public policy research [Accessed 21st August 2013].

Barber, M. Donnelly, K. and Rizvi, S., 2013. *An Avalanche is Coming: Higher Education and the Revolution Ahead*. Available through: Institute for public policy research [Accessed 19th August 2013].

Barefootcollege, 2014. [online] Available at: <<http://www.barefootcollege.org/>> [Accessed 2 July 2014].

Berret, D., 2012. *How 'Flipping' the Classroom can Improve the Traditional Lecture*. Available through: The Chronicle of Higher Education [Accessed 21st August 2013].

Bloom, E. et al., 2014. *Education and Skills 2.0: New Targets and Innovative Approaches*. Geneva: Switzerland. World Economic Forum.

Braun, V. and Clarke, V., 2006. *Using Thematic Analysis in Psychology*. *Qualitative Research in Psychology*, 3: 77-101.

Brinthaupt, T.M. et al., 2011. *What The Best Online Teachers Should Do*. 7 (4), p.518.

Bingimlas, K.A., 2009. *Barriers To The Successful Integration of ICT in Teaching and Learning Environments: A Review Of The Literature*. 5(3), 235 – 245. RMIT University, Australia.

Chen, N.S. and Hwang, G.J., 2014. *Transforming The Classrooms: Innovative Digital Game Based Learning Designs And Applications*. [online] Available at:< http://www.ifets.info/journals/17_2/1.pdf> [Accessed 30 May 2014]

Cisco, 2011. *Transforming Education, Transforming Lives: A Path Toward Next Generation Teaching and Learning*. [online] Available at:< http://www.cisco.com/web/strategy/docs/education/transforming_edu_wp.pdf> [Accessed 14 May 2014].

Cooper, D. and Schindler, P.S., 2014. *Business Research Methods*. 12th ed. New York: McGraw-Hill Irwin.

Creswell, J. W. and Plano Clark, V. L., 2011. *Designing and Conducting Mixed Methods Research*. 2nd ed. Thousand Oaks, CA: Sage.

Department of Communication, 2012. *Address By Minister Dina Pule To The Portfolio Committee During The Presentation of the DOC Strategic and Corporate Plan*. [online] Available at:< http://www.doc.gov.za/index.php?option=com_content&view=article&id=78&Itemid=91> [Accessed 6 July 2014].

Duffy, P., 2008. *Engaging the YouTube Google-Eyed Generation: Strategies for Using Web 2.0 in Teaching and Learning*. [e-journal] 6 (2). pp 119 – 130. Available at: < www.ejel.org/issue/download.html?idArticle=64> [Accessed 21 May 2014].

Educase, 2013. *7 Things You Should Know About Collaborative Learning* [online] Available at: <<http://educase.edu/eli>> [Accessed 18 August 2013].

Educase, 2013. *7 Things You Should Know About Connected Learning* [online] Available at: <<http://educase.edu/eli>> [Accessed 18 August 2013].

Educase, 2013. *7 Things You Should Know About Intelligent Tutoring Systems* [online] Available at: <<http://educase.edu/eli>> [Accessed 18 August 2013].

Educase, 2013. *7 Things You Should Know About Learning Tools Inoperability* [online] Available at: <<http://educase.edu/eli>> [Accessed 18 August 2013].

Educase, 2013. *7 Things You Should Know About Makerspaces* [online] Available at: <<http://educase.edu/eli>> [Accessed 18 August 2013].

Educase, 2013. *7 Things You Should Know About MOOCS II* [online] Available at: <<http://educase.edu/eli>> [Accessed 18 August 2013].

Educase, 2013. *7 Things You Should Know About Video Communication* [online] Available at: <<http://educase.edu/eli>> [Accessed 18 August 2013].

Edudemic, 2014. *What Does Learning Look Like? A Look at Physical and Digital Spaces*. [online] Available at: < <http://www.edudemic.com/learning-look-like-look-physical-digital-spaces/>> [Accessed 10 July 2014].

Edtechteacher, 2014. *Technology Resources for Teaching Science*. [online] Available at: < <http://edtechteacher.org/index.php/teaching-technology/tswt> > [Accessed 14 May 2014].

EADI, 2005. *Role of NGOs in Education Sector Development Programme in Developing Countries*. [online] Available at: < <http://eadi.org/database/?dataset=egc2005&table=data&id=77> > [Accessed 7 July 2014].

European Commission, 2013. *The Teaching and Learning International Survey (TALIS)*. [online] European Commission. Available at: < http://ec.europa.eu/education/library/reports/2014/talis_en.pdf> [Accessed 6 November 2014].

Futurelab, 2006. *Literature Review In Mobile Technologies and Learning*. [online] Bristol: Futurelab. Available at: <www.futurelab.org.uk/research/lit_reviews.htm> [Accessed 13 October 2014].

Forbes, 2014. *The World's Fastest Growing Megacities*. [online] Available at:<<http://www.forbes.com/sites/joelkotkin/2013/04/08/the-worlds-fastest-growing-megacities/>> [Accessed 18 May 2014].

Fox, T.D. Vos, N.B. and Geldenhuys, J.I., 2007. *The Experience of Cross-Cultural Peer Teaching for a Group of Mathematics Learners*. 65, pp. 45 -52.

Godwin -Jones, R., 2012. *Emerging Technologies Challenging Hegemonies in Online Learning*: Available through: Language Learning and Technology [Accessed 17th August 2013].

Global Conflicts, 2014. [online] Available at: <<http://www.globalconflicts.eu/>> [Accessed 25 May 2014].

Glance, D.G., Forsey, M and Riley, M., 2013. *The Pedagogical Foundations of Massive Open Online Courses*, 6 May,18 (5), p.7.

Godwin-Jones, R., 2012. *Emerging Technologies: Challenging Hegemonies in Online Learning*. 16 (2), p.10.

Groff, J., 2013. *Technology Rich Innovative Learning Environments*. [online] Available at: <<http://www.oecd.org/edu/cei/Technology-Rich%20Innovative%20Learning%20Environments%20by%20Jennifer%20Groff.pdf>> [Accessed 21 August 2014].

Gardiner, M., 2008. *Education in Rural Areas*. [online] Johannesburg: Centre for Education Policy Development. Available at: <[http://www.cepd.org.za/files/CEPD_Issues_in_education_Education_in_rural_areas.p](http://www.cepd.org.za/files/CEPD_Issues_in_education_Education_in_rural_areas.pdf)df> [Accessed 17 November 2014].

Glance, D., Forsey, M. and Riley, M., 2013. *The Pedagogical Foundations of Massive Open Online Courses* [online]. Available at: <<http://firstmonday.org/ojs/index.php/fm/article/view/4350/3673>> [Accessed 18 August 2013].

Hwang, G.J., Sung, H.Y., Hung C.M., Huang, I., and Tsai, C.C. (2012a). Development of a Personalized Educational Computer Game Based on Students' Learning Styles. *Educational Technology Research And Development*, 60(4), 623 – 638.

Hannon, V., Patton, A. and Temperley, J., 2011. *Developing an Innovation Ecosystem for Education*. United Kingdom. Cisco.

International Labour Office, 2010. *A Skilled Workforce for Strong, Sustainable and Balanced Growth*. [online] Geneva: International Labour Office. Available at: < <http://www.oecd.org/g20/meetings/toronto/G20-Skills-Strategy.pdf> > [Accessed 6 November 2014].

iShackliving, 2014. *Research for Incremental Upgrading of Informal Settlements*. [online] Available at: < <http://www.ishackliving.co.za/about.htm> > [Accessed 18 May 2014].

Jansen, J. and Taylor, N., 2003. *Educational Change in South Africa 1994 – 2003: Case Studies in Large- Scale Education Reform*. Vol. 2. Education Reform and Management Publication Series.

Jisc, 2014. A Guide to Open Educational Resources [online] Available at: < <http://www.jisc.ac.uk/publications/programmerelated/2013/Openeducationalresources.aspx> > [Accessed 13 April 2014].

Johnson, O., Maasdorp, L. and McElwee, C., 2014. *Education and Skills 2.0: New Targets and Innovative Approaches*. Switzerland: World Economic Forum.

Kothari, C.R., 2004. *Research Methodology: Models & Techniques*. 2nd ed. New Delhi: New Age International (P) Ltd.

Krishnaswami, O.R and Ranganatham, M. 2007. *Methodology of Research in Social Sciences*. 2nd Revised Edition. Mumbai: Himalaya Publishing House

Leadbeater, C., and Wong, A., 2010. Learning From The Extremes. [online] Available at: < http://www.cisco.com/web/about/citizenship/socio-economic/docs/LearningfromExtremes_WhitePaper.pdf > [Accessed 2 September 2014]

Liaw, S.S., Huang, H.M., and Chen, D.G., 2006. *Surveying Instructor and Learner Attitudes Toward E-Learning*. *Computers and Education*, [e-journal] 49 (2007), p. 1077, Available through: <www.sciencedirect.com> [Accessed 26 May 2014].

Lowden, K. Hall, S. Elliot, D. and Lewin, J., 2011. *Employers' Perceptions of the Employability Skills of New Graduates*. London: Edge Foundation.

Maharishi Institute, 2014. *About the Institute*. [online] Available at: <<http://maharishiinstitute.org/the-institute/about-the-institute/>> [Accessed 20 November 2014].

Mail & Guardian, 2012. *More Textbooks Found Fumped in Limpopo*. [online] Available at: <<http://mg.co.za/article/2012-08-07-more-textbooks-found-dumped-in-limpopo>> [Accessed 5 July 2012].

Martin, F., 2012. *Will Massive Open Online Courses Change How We Teach: Sharing Recent Experiences with an Online Course*. Vol. 55. Available through: Communications of the ACM [Accessed 21st August 2013].

Milburn, A., 2012. *University Challenge: How Higher Education Can Advance Social Mobility*. A progress report by the Independent Reviewer on Social Mobility and Child Poverty.

Modisaotsile, B.M., 2012. *The Failing Standard of Basic Education in South Africa*. [online] Pretoria: Africa Institute of South Africa. Available at: <<http://www.ai.org.za/wp-content/uploads/downloads/2012/03/No.-72.The-Failing-Standard-of-Basic-Education-in-South-Africa1.pdf>> [Accessed 17 November 2014].

Ndlovu, S.N., and Lawrence, D., 2012. *The Quality of ICT Use in South African Classrooms*. [online] Cape Town: Ndlovu, S.N., and Lawrence, D. Available at: <http://www.carnegie3.org.za/docs/papers/197_Ndlovu_The%20quality%20of%20ICT%20use%20in%20South%20African%20classrooms.pdf> [Accessed 6 May 2014].

National Academy of Engineering, 2014. *Urbanization & Engineering*. [online] Available at: <<https://www.nae.edu/Publications/Bridge/UrbanizationEngineering/MegacitiesandtheDevelopingWorld.aspx>> [Accessed 11 May 2014].

National Planning Commission, 2011. *National Development Plan*. Vision for 2030. [online] Available at: < <http://www.npconline.co.za/medialib/downloads/home/NPC%20National%20Development%20Plan%20Vision%202030%20-lo-res.pdf> > [Accessed 4 July 2014]

Obami, 2014. [online] Available at: < <http://www.obami.com/> > [Accessed 2 July 2014].

OECD Education Today, 2014. *Education and Skills Using Today's Technologies*. [online] Available at: < <http://oecdeducationtoday.blogspot.com/2013/10/education-and-skills-using-todays.html> > [Accessed 8 July 2014].

Organisation for Economic Co-operation and Development, 2010. *Inspired by Technology, Driven by Pedagogy: A Systematic Approach to Technology-Based School Innovations*. OECD: Paris France.

Organisation for Economic Co-operation and Development, 2014. *Fostering Innovation to Address Social Challenges*. [online] Available at: < <http://www.oecd.org/science/inno/47861327.pdf> > [Accessed 18 May 2014].

Phurutse , M. C., 2005. *Factors Affecting Teaching and Learning in South African Public Schools*. [online]Cape Town: Human Sciences Research Council Press. Available at: < <http://www.wsu.ac.za/hsrc/html/2111-6.pdf> > [Accessed 17 November 2014].

Policy Horizons Canada., 2011. *The Next Economy: Transformation And Resilience In Times Of Rapid Change*. [online]. Available at: < <http://www.horizons.gc.ca/sites/default/files/Publication-alt-format/2012-0126-eng.pdf> > [Accessed 8 April 2014]

Pope, C. and Mays, N., 2006. *Qualitative Research in Health Care*. 3rd ed. Massachusetts, Blackwell Publishing.

Prince, K., 2014. *Glimpses of the Future Of Education. Building the Future of Education: Museums And The Learning Ecosystem*.

Ramirez, F.O. and Boli, J., 1987. *The Political Construction of Mass Schooling: European Origins and Worldwide Institutionalisation*, [e-journal] 60 (1), Available through: JSTOR database [Accessed 8 July 2014].

Saunders, M. Lewis, P. and Thornhill, A., 2007. *Research Methods for Business Students*. 4th ed. Essex: Pearson Education Limited.

Saunders, M. Lewis, P and Thornhill, A., 2009. *Research Methods for Business Students*. 5th ed. Essex: Pearson Education Limited.

Sekaran, U. and Bougie, R., 2013. *Research Methods for Business*. West Sussex: John Wiley & Sons Ltd.

Sekaran, U., 2003. *Research Methods for Business. A Skill Building Approach*. 4th ed. New York: John Wiley & Sons, Inc.

Selwyn, N. 2010. *Web 2.0 and the School of the Future, Today*. In, OECD (Eds.), *Inspired by Technology, Driven by Pedagogy: A Systematic Approach To Technology-Based School Innovations*. OECD: Paris, France.

Sica, L. S. et al., 2011. *The “Teaching to Teach with Technology” Project: Promoting Advanced Games Technologies in Education*. In: *Proceedings International Conference “The future of Education”*. Firenze, Italy, 2011, Simonelli Editore-University Press.

Science Leadership, 2014. [online] Available at: <<http://www.scienceleadership.org/>> [Accessed 4 September 2014].

Stanford Social Innovation Review, 2014. *Informing and Inspiring Leaders of Social Change*. [online] Available at: http://www.ssireview.org/articles/entry/redefining_education_in_the_developing_world [Accessed at 18 May 2014].

Southafrica.Info, 2014. *Budget 2014 Spending at a Glance*. [Online] Available at: <http://www.southafrica.info/business/economy/policies/budget2014b.htm#.U15kjTEe3_E> [Accessed 22 May 2014].

Soysal, Y.N., and Strang, D., 1989. *Construction of the First Mass Education Systems in Nineteenth-Century Europe*. *Sociology of Education*, [e-journal] 62. Available at: <http://www.soc.cornell.edu/faculty/strang/articles/Construction%20of%20the%20First%20Mass%20Education%20Systems.pdf> [Accessed 6 July 2014].

Teach-nology, 2014. *The Effects of Poverty on Teaching and Learning*. [online] Available at: < <http://www.teach-nology.com/tutorials/teaching/poverty/> > [Accessed 2 July 2014].

The Department of Basic Education and Higher Education and Training, 2011. *Integrated Strategic Planning Framework For Teacher Education and Development in South Africa*. The Departments Of Basic Education and Higher Education and Training: Pretoria.

The Development Bank of South Africa (DBSA), 2011. *Prospects for South Africa's Future*. [online] South Africa, Development Planning Division. Available at: <<http://www.dbsa.org/EN/About-Us/Publications/General/DBSA%20Development%20Report%202011.pdf>>. [Accessed 6 November 2014].

The World Bank, 2013. *Education in Sub Saharan Africa*. [online] Available at: <<http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/AFRICAEXT/EXTAFRREGTOPEducation/0,,contentMDK:21678040~menuPK:4762592~pagePK:34004173~piPK:34003707~theSitePK:444708,00.html>> [Accessed 11 May 2014].

World Economic Forum, 2014. *Education and Skills 2.0: New Targets and Innovative Approaches*. [online] Geneva: World Economic Forum. Available at: <<http://www.weforum.org/reports/education-and-skills-20-new-targets-and-innovative-approaches>> [Accessed 21 July 2014].

World Economic Forum, 2013. *The Global Competitiveness Report*. [online] Geneva: World Economic Forum. Available at: <http://www3.weforum.org/docs/WEF_GlobalCompetitivenessReport_2013-14.pdf> [Accessed 20 November 2014].

The World Summit on the Information Society (WSIS), 2014. *Adapt All Primary and Secondary Curricula to Meet the Challenges of the Information Society, Taking Into Account National Circumstances*. [online] Geneva. Available at: <http://www.itu.int/en/ITU-D/Statistics/Documents/publications/wsisreview2014/WSIS2014_review_target7.pdf> [Accessed 6 November 2014].

Wagner, T., 2014. *The Global Achievement Gap*. [online] Available at: <<http://www.tonywagner.com/resources/the-global-achievement-gap>> [Accessed 12 May 2014].

Wang, D., 2014. *A Study on English Learning Strategy in the Smartphone Based Environment*. [online] Xi'an: Sciencepaper Online. Available at: <www.paper.edu.cn/download/downPaper/201404-426> [Accessed 18 August 2014].

WhatsApp Blog, 2014. *5000,000,000*. [online] Available at: <<http://blog.whatsapp.com/>> [Accessed 23 October 2014].

United Nations Development Programme, 2012. *Mobile Technologies and Empowerment*. [online] United Nations Development. Available at: <https://www.undpegov.org/sites/undpegov.org/files/undp_mobile_technology_primer.pdf>. [Accessed 7 November 2014].

United Nations Populations Fund, 2014. *Linking population, Poverty and Development*. [online] Available at: <<http://www.unfpa.org/pds/urbanization.htm>> [Accessed 11 May 2014].

Van Der Berg, S. et al., 2011. *Low Quality Education as a Poverty Trap*. A Research Project Undertaken by the Social Policy Research Group in the Department of Economics at Stellenbosch University. Retrieved from <<https://www.andover.edu/GPGConference/Documents/Low-Quality-Education-Poverty-Trap.pdf>> [Accessed 6 July 2014].

Waard, I. Koutropoulos, A. Keskin, N. Abajian, S. Hogue, R. Rodriguez, C and Gallagher, M., 2011. *Exploring the MOOC Format as a Pedagogical Approach for Learning*: 10th World Conference on Mobile and Contextual Learning.

Welman, C. and Kruger, F., 2001. *Chapter 3 Research Design and Methodology*. [Online] Available at: <<http://wiredspace.wits.ac.za/bitstream/handle/10539/6994/03Chapter3.pdf?sequence=>> [Accessed 17 September 2014].

Yan, P., 2014. *Optimise the Teaching of English Majors' Optional Course Via M-Learning*. [online] Nanchon, P.R. China: Yan, P. Available at: <http://www.atlantispress.com/php/download_paper.php?id=12546> [Accessed 24 July 2014].

Appendix A: Cover letter



higher education
& training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

CENTEC CAMPUS



Enquiries:	Telephone: (031) 203 5500	Date: 23 April 2014
Imbizo:	Fax Number: (031) 208 5498	Usuku:
Navrae:	Address: 75 Earl Haig Rd, Dbn	Datum:


To: UNIVERSITY OF KWA-ZULU NATAL

PERMISSION TO CONDUCT RESEARCH

I, the undersigned, do hereby grant Shaun David Randles permission to conduct research in the Business Studies Department at Thekwini College – Centec Campus. The research topic is “The strategic importance of education technology in the public FET college in the greater Durban area”.

The study will examine the skills mismatch challenges students are facing in it's FET classrooms, who lack quality skills that are required to promote their socio economic stature in South Africa in the next 15 years.

The permission is granted on condition that it does not interfere with the lectures on the campus.


A.C. SIMPSON
CAMPUS MANAGER

A.C. SIMPSON : CAMPUS MANAGER

Centec Campus, Thekwini FET College
75 Earl Haig Road, Roseglen, Durban
Private Bag X31, Greyville, 4023
Tel: 031 203 5500 Fax: 031 208 5498
Email: simpsona.tekumb@feta.gov.za

Central office	031 250 8400, Private Bag X 06, Dormerton, 4015
Asherville Campus	031 250 8200, 262 D'Aintree Avenue, Asherville
Cato Manor Campus	031 273 3650, Corner of Booth & Ridgeview Roads, Cato Manor
Centec Campus	031 203 5500, Corner of Earl Haig & Hendry Roads, Morningside
Melbourne Campus	031 327 5700, Corner of Sydney & Blake Roads, Dalbridge
Springfield Campus	031 263 7700, Corner of Umgeni & Bisasar Roads, Springfield Flats
Umbilo Campus	031 205 6841, 351 Umbilo Road, Umbilo

Appendix B: The interview

Qualitative Interview

Investigate the impact of the business skills shortage in the FP&M sector upon FET graduates employability in the emergent economy.

1. What is your company's name?
2. In which sub sector do you work within the FP&M seta?
3. What is your position within the organisation?
4. What is your highest qualification?
5. What is your normal company size?
6. What is your company's annual turnover
7. What is your company's annual training budget as a percent of turnover?
8. Does your company employ a skills development facilitator?
9. Does your organisation place a strategic importance on skills development?
10. Are there specific business management skills that your organisation has difficulty finding in FET college graduates?
11. What is your attitude towards current FET graduate's lack of skills upon employability in your company?
12. Do open positions in your organisation remain difficult to fill with the current talent that comes from public FET colleges?
13. Do you feel that the FET graduates who apply for open positions in your organisation already have the necessary business management skills training?
14. Do you feel that your industry will suffer over a long period of time from the shortage of skilled FET graduates without the satisfactory business management skills?

Mobile Messaging Technology (MMT) can be best described as a Short Message Service (SMS). A SMS is a text messaging service component of phone, Web, or mobile communication systems. It uses standardized communication protocol to allow fixed line or mobile phone devices to exchange short text messages.

WhatsApp messenger is a cross-platform mobile messaging app which allows you to exchange messages without having to pay for SMS. WhatsApp is the main platform that is being researched, and so the term 'mobile messaging technology' below refers mainly to WhatsApp.

Qualitative Interview

To investigate the attitudes of financial management students from a Durban FET college towards MMT as an innovative technique of teaching and learning

1. Why do you think that it is important for FET students to be given access to knowledge and expertise on business skills 'remotely' by means of MMT?
2. What is your attitude about FET students needing more encouragement to access 'informal' learning 'remotely' by means of MMT?
3. What do you think your employees attitude would be towards your organisation incorporating MMT as an informal training method?
4. What do you feel your senior managers attitudes are towards offering free 'informal' business skills training over the Internet for FET students by means of MMT?
5. What do you think your senior managers feelings are towards sharing business knowledge and expertise over the Internet for FET students to use by means of MMT?

To investigate the attitudes of financial management teachers from a Durban FET college towards *mobile messaging* technology as an innovative technique of teaching and learning

1. What do you think the total workforce attitude would be towards the organisation using MMT to teach and learn business skills?
2. What do you think the workforce attitude would be towards helping train FET students on what your organisation business skills requirements are, and what standard they expect?
3. What do you think the challenges would be using MMT to informally teach business skills?
4. What do you feel about using MMT to drive your employees to teach and learn from one another?
5. What do you think your senior manager's attitudes are towards using videos by means of MMT to teach FET student's appropriate new skills and knowledge?
6. What is your point of view towards being included in developing free business skills courses that are taught online by means of MMT to motivate FET students to learn?
7. Would you be anxious about the standards dropping if FET students started to use MMT to teach or learn business skills?

To investigate the effectiveness of MMT as a technique of teaching and learning using a case study of a financial management programme of a Durban FET college.

1. What do you think your senior manager's viewpoint is towards using MMT to interact with colleagues to teach and learn appropriate workplace skills?
2. Do you feel that using MMT to teach and learn in the workplace is a bad idea because employees will be distracted constantly during working hours?
3. Do you think MMT is able to be an easier yet reliable technique to teach and learn business management skills to one another?
4. Do you think that your organisation would avoid using MMT for informal, on- the-job learning because of the effort required?
5. Overall, does MMT meet the requirements of your organisation as a new way of teaching and learning?

Appendix C: The questionnaire

UNIVERSITY OF KWAZULU-NATAL GRADUATE SCHOOL OF BUSINESS & LEADERSHIP

MBA Research Project

Researcher: Shaun David Randles (082 926 1663)

Supervisor: Dr. Abdul Kader (031 584 9900)

Research Office: Ms P Ximba 031-2603587

Title of the Questionnaire

Understanding students and teacher's attitudes towards using mobile messaging technology as a new way of teaching and learning.

The Purpose Of This Survey

It is the aim of the researcher to investigate the attitudes of the students and teachers from the CENTEC campus towards using mobile messaging as a new way of teaching and learning.

The information and ratings that you give will go a long way in helping the researcher to identify the willingness and readiness of students and teachers towards using mobile messaging, specifically WhatsApp, as a new way of teaching and learning.

In this questionnaire, you are asked to indicate what is true for you. So there are no "right" or "wrong" answers to any question!

If you wish to make a comment please write it directly on the questionnaire itself. And, if you have a query about the questionnaire just ask for help.

Please can you make sure that you do not skip any of the questions as it has an effect on the accuracy and legibility of the researchers work?

This questionnaire has 25 questions, it has 6 pages, and it should only take you about **10** minutes to complete.

Thank you for participating.

Shaun Randles

"Problem solving does not exist in isolation"

Demographic Information

1. Are you a?

☐ Student

☐ Teacher

2. Indicate your age group

☐ 14 - 17

☐ 18 – 24

☐ 25 – 34

☐ 35 – 44

☐ 45 – 54

☐ 55 – 65

☐ 65 and over

3. What is your monthly income?

☐ R 0 – R 1 500

☐ R 1 501 – R 3 000

☐ R 3 501 - R 5 500

☐ R 5 501 - R 10 500

☐ R 10 501 - R 15 500

☐ R 15 501 – R 20 500

☐ R 20 501 – R 25 000

☐ R 25 001 and over

4. How would you describe your dwelling where you currently stay?

☐ House

☐ Semi detached house

☐ Flat

☐ Hostel

☐ Informal dwelling / shack

☐ Other (please specify): _____

Social Media Experience

5. Please rank in order your 3 favourite social media. Do this by writing a 1 next to your favourite, a 2 next to your second favourite, and a 3 next to your third favourite. Those not in your top 3 should be left blank.

___ YouTube

___ WhatsApp

___ Twitter

___ Blogs

___ WeChat

___ Facebook

___ Google+

___ LinkedIn

___ Instagram

___ Blackberry Messenger (BBM)

6. How much time do you spend on social media in your day?

☐ Less than 30 minutes

☐ 31 - 60 minutes

☐ 1– 2 hours

☐ 2 – 4 hours

☐ More than 4 hours

Attitude Toward Using Mobile Messaging Technology In Class

Mobile messaging technology can be best described as a Short Message Service (SMS). A SMS is a text messaging service component of phone, Web, or mobile communication systems. It uses standardized communication protocol to allow fixed line or mobile phone devices to exchange short text messages.

WhatsApp messenger is a cross-platform mobile messaging app which allows you to exchange messages without having to pay for SMS. WhatsApp is the main platform that is being researched, and so the term 'mobile messaging technology' below refers mainly to WhatsApp.

Indicate your level of agreement with each of the following statements, by ticking the response that matches your opinion. Remember there are no right or wrong answers.

7. When a teacher is not available, and I need help, peer-to-peer teaching is something that I need. *A peer is someone who is the same as you in a group*

- ☐ Strongly agree
- ☐ Agree
- ☐ Neutral
- ☐ Disagree
- ☐ Strongly disagree

8. I use online tools like messaging boards, discussion forums, chats and blogs to communicate with peers.

- ☐ Strongly agree
- ☐ Agree
- ☐ Neutral
- ☐ Disagree
- ☐ Strongly disagree

9. I am worried about my standards dropping if I start to use my mobile to teach or learn.

- ☐ Strongly agree
- ☐ Agree

- ☐ Neutral
- ☐ Disagree
- ☐ Strongly disagree

10. I would like to be included in developing teaching materials that are relevant and motivate me to teach or learn. *Teaching materials are the resources (notes, lectures and presentations) that a teacher uses to give their lesson.*

- ☐ Strongly agree
- ☐ Agree
- ☐ Neutral
- ☐ Disagree
- ☐ Strongly disagree

11. I would like to experiment with using videos through my mobile to teach or learn appropriate new skills and knowledge.

- ☐ Strongly agree
- ☐ Agree
- ☐ Neutral
- ☐ Disagree
- ☐ Strongly disagree

Perceived Usefulness Of Mobile Messaging Technology As A New Way Of Teaching And Learning

12. Mobile messaging technology enables me to complete a task / assignment more quickly.

- ☐ Strongly agree
- ☐ Agree
- ☐ Neutral
- ☐ Disagree
- ☐ Strongly disagree

13. Mobile messaging technology increases my productivity in the academic setting.

- ☐ Strongly agree
- ☐ Agree
- ☐ Neutral
- ☐ Disagree
- ☐ Strongly disagree

14. Mobile messaging technology makes it easier to do my work.

- ☐ Strongly agree
- ☐ Agree
- ☐ Neutral
- ☐ Disagree
- ☐ Strongly disagree

Perceived Ease Of Use Of Mobile Messaging Technology

15. Learning to operate mobile messaging technology is easy for me.

- ☐ Strongly agree
- ☐ Agree
- ☐ Neutral
- ☐ Disagree
- ☐ Strongly disagree

16. It is easy for me to become skillful in using mobile messaging technology.

- ☐ Strongly agree
- ☐ Agree
- ☐ Neutral
- ☐ Disagree
- ☐ Strongly disagree

17. I find it easy to use mobile messaging technology to do what I want it to do.

- ☐ Strongly agree
- ☐ Agree
- ☐ Neutral
- ☐ Disagree
- ☐ Strongly disagree

Intention To Use Mobile Messaging Technology

18. Whenever possible, I intend to use mobile messaging technology everyday.

- ☐ Strongly agree
- ☐ Agree
- ☐ Neutral
- ☐ Disagree
- ☐ Strongly disagree

19. I would use mobile messaging technology to do different tasks / assignments.

- ☐ Strongly agree
- ☐ Agree
- ☐ Neutral
- ☐ Disagree
- ☐ Strongly disagree

Mobile Messaging Technology Self-Efficacy

Self-efficacy is the extent or strength of your belief in your own ability to complete tasks and reach goals.

20. I could complete a task / assignment using mobile messaging technology if I had seen someone else using it before trying it myself.

- ☐ Strongly agree
- ☐ Agree
- ☐ Neutral
- ☐ Disagree
- ☐ Strongly disagree

21. I could complete a task / assignment more easily if I could contact someone for help using mobile messaging technology if I got stuck.

- ☐ Strongly agree
- ☐ Agree
- ☐ Neutral
- ☐ Disagree
- ☐ Strongly disagree

22. I could complete a task / assignment using mobile messaging technology if someone showed me how to use it first.

- ☐ Strongly agree
- ☐ Agree
- ☐ Neutral
- ☐ Disagree
- ☐ Strongly disagree

The Relevance Of Mobile Messaging Technology As A New Way Of Teaching And Learning

23. I consider mobile messaging technology to be important to teaching and learning.

- ☐ Strongly agree
- ☐ Agree
- ☐ Neutral
- ☐ Disagree
- ☐ Strongly disagree

24. I believe mobile messaging technology is needed in my class.

- ☐ Strongly agree
- ☐ Agree
- ☐ Neutral
- ☐ Disagree
- ☐ Strongly disagree

25. I believe mobile messaging technology would enhance motivation to teach and learn.

- ☐ Strongly agree
- ☐ Agree
- ☐ Neutral
- ☐ Disagree
- ☐ Strongly disagree

Thank you for taking the time to complete the questionnaire.

Shaun David Randles

082 926 1662

18 August 2014

20 May 2014

Mr Shaun David Randles (201300626)
Graduate School of Business & Leadership
Westville Campus

Protocol reference number: HSS/0432/014M

Project title: The strategic importance of Education Technology in the public FET colleges in Durban

Dear Mr Randles,

Full Approval – Expedited Application

In response to your application dated 24 April 2014, the Humanities & Social Sciences Research Ethics Committee has considered the abovementioned application and the protocol have been granted **FULL APPROVAL**.

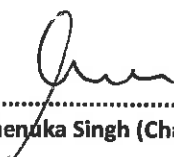
Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment/modification prior to its implementation. In case you have further queries, please quote the above reference number.

PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years.

The ethical clearance certificate is only valid for a period of 3 years from the date of issue. Thereafter Recertification must be applied for on an annual basis.

I take this opportunity of wishing you everything of the best with your study.

Yours faithfully



.....
Dr Shenuka Singh (Chair)

/ms

Cc Supervisor: Dr Abdul Kader
cc Academic Leader Research: Dr E Munapo
cc School Administrator: Ms Zarina Bullyraj

Humanities & Social Sciences Research Ethics Committee

Dr Shenuka Singh (Chair)

Westville Campus, Govan Mbeki Building

Postal Address: Private Bag X54001, Durban 4000

Telephone: +27 (0) 31 260 3587/8350/4557 Facsimile: +27 (0) 31 260 4609 Email: ximbap@ukzn.ac.za / snymanm@ukzn.ac.za / mohunp@ukzn.ac.za

Website: www.ukzn.ac.za



100 YEARS OF ACADEMIC EXCELLENCE

Founding Campuses:  Edgewood  Howard College  Medical School  Pietermaritzburg  Westville